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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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POLIOMYELITIS

A Review of Its Epidemiology with Especial Consideration of the Autarceological Concept of Immunity

ALEX G. BERGER, M.D.
Minneapolis, Minnesota

FEW diseases can boast of as much interest as has been centered, of late, on poliomyelitis. Few diseases have been discussed, written about and investigated as much as this disease. Yet every now and then one sees the statement that, in the past two decades, very little new epidemiological understanding has really been acquired. It is, therefore, fitting to occasionally review this disease and evaluate representative portions of the vast epidemiological data that have been presented in recent years. It is hoped that in this manner one may get some idea of the progress, if any, that has been made towards the attainment of a clearer and more complete understanding of this infection.

Poliomyelitis is not a new disease. Evidence of its effects are believed traceable as far back as 1600 B.C.⁴¹ Yet the first clear description of the disease seems to have originated with Underwood in 1799. More complete descriptions were furnished by Heine in 1840 and Medin in 1875. In 1905, first mention of its apparent communicability was made by Wickman. It was not, however, until 1909, when Landsteiner and Popper demonstrated the possibility of reproducing the disease in monkeys⁴⁷, that scientific corroboration of the various epidemiological considerations could be attempted.

A mass of experimental data has since been produced. Much of this is controversial and confusing. A clearer picture can be obtained only

by a careful evaluation of the various concepts suggested. A brief consideration of each factor involved in the communication of this disease is therefore presented.

Etiological Agent

Briefly, it can be stated that most investigators are pretty well agreed that poliomyelitis is caused by a filterable virus. Rosenow, however, is of the opinion that the etiologic agent is a pleomorphic streptococcus. He points out that streptococci are not infrequently isolated from the cord and spinal fluid of poliomyelitis cases. The general opinion, nevertheless, is that such streptococci are unrelated to the disease and hence without etiological significance.⁴⁷

Much time has been given to the study of the virus, yet much more work needs to be done. Our ideas on immunity in poliomyelitis, as well as any attempts to trace the transmission and effects of this organism are greatly dependent on our ability to isolate the specific strain of virus causing the particular outbreak of the disease. The confusion and controversial opinions as to whether immune bodies are produced during a poliomyelitis infection may well be due to lack of specificity in the strain of virus used. Though various strains have been isolated, several investigators feel that many more strains exist in nature, many of which may appear simultaneously in the same outbreak. Aycock has recently pointed out that discrepant neutralization tests in poliomyelitis seem to be due to the use of

Dr. Berger is Director of the Acute Communicable Disease Division, Department of Public Health, Minneapolis, Minnesota.

heterologous strains of virus; and when under controlled conditions a single strain can be isolated in a localized outbreak, all the convalescent cases reveal both the presence of immune bodies and immunity to that particular strain.⁹

Reservoir

Even before experimental evidence could be obtained, it had been assumed that the human animal was the only reservoir of poliomyelitis infection. Today, even after much investigation, the human being is still the only known reservoir. The possibility of other reservoirs, such as rodents or birds, must however be considered. Thus Jungeblut reported the recovery of poliomyelitis virus from a mouse found dead in a home where there had just been a fatal case of poliomyelitis¹⁸; also, in nine out of 100 samples of normal human sera examined, neutralization of Theilers virus of mouse encephalomyelitis has been obtained.³⁶ Birds have been found to play a part in equine encephalomyelitis "which is another summer viral disease of the central nervous system"⁴² and therefore, must be considered a possible source of poliomyelitis.

The human reservoir consists of both frank and abortive cases, convalescent carriers, and normal carriers. Virus has been isolated from the nasal washings and intestinal discharges of both cases and healthy contacts. Such findings can well indicate the wide distribution of virus throughout the general population.²⁸

Escape of the Virus

Escape or liberation of the virus from the human body seems to be accomplished in two ways; i.e., from the nasopharynx and the intestine. Virus has been found in nasal washings and on various sections of the oropharynx, especially in tonsillar and peritonsillar areas.²⁰ Still larger amounts of virus have been recovered from the feces of both case and carrier and has persisted in such excretions, occasionally for months.²⁹ Since the virus has rarely been isolated from human blood or lymph, the possibility of its escape from such media via a sucking insect is not considered likely at this time.⁴⁷

Modes of Transmission

No definite agreement has, as yet, been arrived at regarding the method of transmission of poliomyelitis. Both the direct and indirect meth-

ods have its proponents. The recovery of poliomyelitis virus from intestinal discharges, from water, and sewage,³³ and its ability to survive the effect of chlorine in a concentration of 0.5 parts per million for one and a half hours,²⁷ are facts both interesting and worthy of contemplation. Such facts make it seem quite feasible for water to be a factor in poliomyelitis transmission. Still, as Maxcy points out, the epidemiology of poliomyelitis does not seem to correspond with the characteristics of a water-borne infection. In water transmission, you tend to have an explosive outbreak of infection, affecting, more or less simultaneously, a large number of people. These individuals are scattered rather than grouped together and have only the one connecting link; i.e., a common water supply which is subject to human pollution. Poliomyelitis, however, characteristically has a slow radial and progressive spread from an initial focus and "moves, in rural areas, at a constant speed from place to place regardless of the character of the local water supplies. There is not a single instance, so far, of an explosive outbreak of this disease which was due to a simultaneous exposure of a group of people to a common source of water."³¹

The possibility of other vectors of the virus beside water must be considered. Aycock has reported an epidemic of poliomyelitis occurring in Broadstairs, England, where the infected cases were all traceable to one milk dealer, with the milk coming from one particular farm.² The role of flies and other insects as factors in the mechanical transmission of the virus may assume increasing importance. In a detailed study of an outbreak of poliomyelitis in Mississippi, Lumsden, who is skeptical of the importance of personal contact as a major factor, emphasizes the possible role that the presence of rats, birds, domestic fowl, cows, flies, mosquitoes, fleas, or other insects might play in poliomyelitis transmission.³⁰ Detection of poliomyelitis virus in flies at various times tends to bolster such a point of view.⁴³ On the other hand, attempts by Toomey and others to recover poliomyelitis virus from fruit, well water, spinal cords of paralyzed chickens and the stools of sick dogs, found in vicinities where human poliomyelitis had occurred, were unsuccessful.⁴⁰

The role of direct contact in poliomyelitis transmission still seems to be the major factor,

according to many investigators. The presence of the virus, not only in clinical cases but also in subclinical cases and even in contacts with no apparent symptoms (healthy carriers), makes possible frequent and unknown contacts with the virus.^{29,44} "It is only by conceiving of the mild and unrecognized cases of poliomyelitis that their means of communicability can be visualized, for study of the actual paralytic cases only, seems to show no relation to each other."²⁸

Various detailed studies of poliomyelitis outbreaks tend to justify the above impression. Thus a study made of a severe epidemic in Walker County, Alabama, indicated that the transmission of the disease could be established as at least 80 per cent patient to patient contact.¹² Another similar detailed study made by Fishbein and Casey in Chicago confirmed the importance of contact in the transmission of the disease and emphasized the possibilities of overlooking mild cases unless an intensive neighborhood study is made.¹² In this connection, moreover, the experience of Perkins in southern Minnesota reveals how easy it is for patients and parents to either forget or to minimize the importance of their contacts with mild undiagnosed illnesses.³⁴ Exhaustive and painstaking questioning is necessary if one is to uncover the possible subclinical contacts made by a clinical case of poliomyelitis.

Portal of Entry

Although the virus of poliomyelitis is definitely neurotropic and apparently gets to the central nervous system by travelling along nerve tracts, no agreement has been reached as to how the virus reaches these nerve tracts nor what nerves are usually affected. Corresponding to the methods of escape of the virus, the two main concepts as to portal of entry concern the nasopharynx and the intestinal tract.

Toomey seems to be the chief exponent of the gastro-intestinal portal of entry.³⁸ He believes that the virus travels best along non-medullated or gray nerve fibers and since the nerve fibers ending in and near the intestinal mucosa are grey, a pathway for the virus to the central nervous system is provided. Toomey has been able to produce poliomyelitis in the monkey by placing virus in its intestine and clamping off that segment for several hours. However, in the unclamped intestine, the virus was swept through so rapidly that infection did not occur. It would

seem, therefore, that conditions promoting the stagnation of intestinal contents, either physiological or anatomical in nature, would favor the penetration of the virus through the intestinal wall and into the sympathetic nerve fibers. Under ordinary conditions, however, the intestinal route of infection would seem to be less likely.

Most of the workers in this field favor the nasopharynx as the portal of entry. Experimental evidence, however, does not uniformly support this concept. Sabin has found characteristic pathological changes to be present in the olfactory bulbs of experimental poliomyelitis but could not confirm such findings in his examination of ten fatal human cases.³⁵ Chemical blockage of the olfactory nerve endings in the nose of a monkey seems to protect it from experimental infection. Similar results with human beings, however, have thus far, not been attained.⁴⁷ It is, therefore, felt that reactions in human beings may not be comparable in every respect to those experimentally attained in monkeys. Nevertheless, as Brodie and others have emphasized, because the virus has been isolated from the mucosa and nasopharyngeal washings of both case and carrier and because the epidemiology of the disease resembles in many respects a droplet infection, it is felt that the most likely portal of entry of the poliomyelitis virus is the nasopharynx.¹⁰

Susceptibility

Probably the outstanding and most interesting feature in the epidemiology of poliomyelitis is its apparent selective occurrence both as to season and individuals affected. Epidemics seem to routinely occur in summer and early fall and clinical cases occur in only a comparatively few of the individuals living in the region affected. Though it has long been noted that the disease may vary considerably in its severity and that a large percentage of those affected never develop paralysis, the full range of the variability in reaction to the poliomyelitis virus is just beginning to be fully appreciated. For not only can the virus be found in definite clinical cases but it has also been isolated from individuals who have experienced either very mild symptoms or none at all. Such findings help us to appreciate the vast extent of poliomyelitis infection and lead us to ask—what then are the factors that determine just what will happen when the virus contacts its human host? What determines whether such a

contact may bring on the much dreaded paralysis or may merely occasion symptoms no worse than a mild respiratory infection? Various answers have been suggested. They can be only briefly considered and evaluated in this review.

It is well to remember that every infection represents an interaction between parasite and host and that the resultant effect is dependent not only on the virulence and number of the invading organisms but also on the powers of resistance of the host. It is quite possible that the specific strain, involved in an outbreak of poliomyelitis may be a major determinant of the severity of that epidemic. Yet many a student of this problem feels that it is more a difference in those exposed rather than a difference in virus or exposure that determines whether or not paralysis occurs.⁶ Consideration of the various factors that may affect the resistance of the host is therefore indicated.

Resistance or immunity of a host may be of a specific or non-specific nature. A specific immunity towards a disease is immunity attained by antibody formation and represents the defensive reaction of the body to the presence of the antigen; i.e., the parasite. Antibodies found in any individual could therefore indicate that, at one time or another, he has been invaded by the corresponding parasitic antigen. Resistance to infection, if dependent on antibody formation, would therefore be found more often in adults than in children and would be higher in urban than in rural areas. For the greater the chance of contacting the causative organism, the greater the possibility of responding with antibody formation. Actually this seems to be true in poliomyelitis. The disease is primarily one affecting children. Rural areas exhibit a comparatively higher incidence of infection among adults than do urban areas and correspondingly a greater percentage of its inhabitants come down with the disease when the poliomyelitis virus happens to strike. Moreover, when we consider that the virus has been isolated from individuals who have experienced only mild constitutional symptoms or none at all and that neutralizing antibodies have been found in the blood of a large percentage of people all over the world,⁴ it becomes easy to appreciate the feeling that poliomyelitis infection may be as widespread as that of measles and that most individuals have attained some immunity to the virus through subclinical infection.

It must be recognized, however, that this concept of latent immunization through subclinical infection is not without its discrepancies or contradictions. Thus Burnet and Jackson found that on comparison of the sera of poliomyelitis patients taken at the acute stage with sera obtained from the same patient two or three months later, no evidence of any significant change in antibody titre could be observed in fourteen cases. They also found that children in the early stages of acute paralytic poliomyelitis may possess relatively large amounts of circulating antibodies or they may have none whatever. The children who had none did not develop any within two to three months after illness. Further, they claimed, none of the family contacts who had no antibodies at the time of contact developed it within a similar period. They, therefore, concluded that "poliomyelitis antibody is not a result of exposure to or infection by the virus of epidemic poliomyelitis."¹¹

Jungeblut, in an attempt to evaluate immunity production in the monkey, reports the following observations: (1) "Occurrence of virucidal antibodies in the serum of monkeys convalescing from a paralytic attack of poliomyelitis is very irregular with respect to its formation, speed of development, and maintenance over long periods of time; (2) Monkeys convalescing from a paralytic attack are uniformly insusceptible to intracerebral reinoculation with the same strain of poliomyelitis virus, irrespective of the presence or absence of the virucidal titre at the time of reinoculation; (3) Reintroduction of virus into the central nervous system of monkeys convalescing from a paralytic attack of poliomyelitis fails to produce an increase in serological titre of virucidal substances;" and (4) A modified form of the virus which produced only fever in the monkey did not seem to protect it from a later more potent dose.²⁵ He therefore feels that immunity and antibody formation are not necessarily attained through virus contact. He suggests that the increase in immunity developing as one grows older may be primarily due to factors inherent in maturity and not due to exposure. He also points out that antibodies found in poliomyelitis cases or contacts are not necessarily similar immunologically to other specific antibodies as found in anti-bacterial and other antiviral serums, for they are not specifically absorbable and do not give such immune reactions as alexin fixation

and precipitation or flocculation.²² This fact alongside the inconsistencies in antibody formation as determined by experimentation would seem to favor this non-specific maturation theory as the more rational concept for the explanation of immunity in poliomyelitis.

However, the maturation theory would not explain why adults in urban areas seem to have more immunity to the virus than do similar aged adults in rural areas. It is also quite possible that many of the inconsistencies noted in respect to the finding or lack of finding of antibodies following poliomyelitis infection may be due to immunity tests with strains of virus not identical with those responsible for the cases being tested. For more recent studies have shown that there are many more strains than previously suspected and that several strains of virus may be involved in the same epidemic. Thus Ayccock has shown that immunity tests performed on a group of patients recovered from poliomyelitis, when tested against an old laboratory strain, gave a positive neutralization in only three out of 10 tests. But when tests were made against a local strain recovered from one of the fatal cases, the virus was neutralized in all ten tests.⁹

Though subclinical infections might explain the increase in immunity acquired as one gets older, it still does not tell us why under similar conditions of exposure, children of similar age react so differently on contact with the virus. Such differences in reaction seem rather to be due to differences in the make-up of the individual, i.e., the non-specific factors of resistance.

The "Poliomyelitis" Type

"Even in the earliest writings about poliomyelitis, there is found the suggestion that the paralytic disease exhibits a tendency to selective occurrence in certain types of individuals."⁸ Descriptions of the disease by Underwood, Heine, and later by Wickman, all draw attention to the fact that poliomyelitis seems to occur most often in the child who appears exceptionally robust and in perfect health. These observers and others who followed them merely noted this fact but did not appreciate the possibility that it might be a fundamental epidemiological feature of the disease. It was Draper who first made a detailed study of such morphologic characteristics and gave impetus to the idea that there may be a definite "poliomyelitis" type.

Thus in his study of the epidemic of infantile paralysis in 1916, Draper makes the following observations:¹³ "The patients displayed certain definite morphologic characteristics which appeared with insistent regularity. The type of child which seems most susceptible to the disease is the large, well grown, plump individual who has certain definite characteristics of face and jaws; is broad browed and broad and round of face. The teeth are particularly interesting. It was noted that in 50 or 60 per cent of all the cases in the hospital at Locust Valley, the central incisor teeth of the upper jaw were separated by a cleft of varying width." "Among the adolescents and young adults who acquired poliomyelitis and in whom the disease seemed always to be most severe and indeed, usually fatal, the type differed from that just described." Here there appeared a more delicately made type. "Of the six or eight fatal cases in young adults, seen by the writer, the similarity of appearance of the individuals was so striking that all might have been of one family. All were brunettes, with very delicate dark skins and high coloring of cheeks and lips." "In this connection, also, it is interesting to note that a surprising number of the fathers of children ill with poliomyelitis presented striking anthropologic markings. Thus one was a definite acromegalic, while two others were clearly Froehlich types, dark haired, fat faces and bodies, narrow shoulders, broad hips and knock-knees. It is interesting too, to record the numerous instances of two, three, four and five cases in families with such parental types, suggesting, possibly, a true family susceptibility."¹³

In a later paper, Draper goes on to say, "Some of the morphologic characters of this group of people which differ from the general population can be demonstrated by anthropometry and expressed in numerical values, other features cannot be subjected to mensuration. But observational and descriptive methods suffice to display the striking qualities." Thus unusually wide interpupillary spaces and wide facial diameters give these children their broad, wide-eyed expression. They also "tend to gain weight and are often definitely pudgy, fat types. The hand index (breadth-length ratio) shows a short broad form. This is ordinarily correlated with acromegaloid trends in the facial structure. The pelvis of these individuals is definitely wide as compared with the shoulders. This character is gen-

erally accepted as a definite mark of the neuter or feministic type. In both sexes, it marks that deficient gonad activity which results in retarded development and checks metamorphosis toward the finished form of the mature individual of either sex. The large bodies and small gonads seem characteristic of these individuals and represent a tendency to overgrowth and retarded development. In non-susceptibles, however, growth and development proceed more in step with each other and with age."¹⁴

Draper suggests that the variations in the degree of the morphological differences extend from barely imperceptible ones to those of highly statistical significance and that this scale may parallel the severity of the individual illness. He also emphasizes the relation of age to maturing achievement. The ages before and after puberty, he says are critical ones in the process of development of the individual. The controls pass through these years with little change in their rates of growth while the poliomyelitis tends to grow faster during the years before and after puberty. Such constitutional characteristics, he concludes, point toward deficiencies of the pituitary, gonads, adrenal cortex and possibly the thyroid glands and may be due to adverse genetic or intra-uterine forces.¹⁴

"Dissenting views of Draper's thesis have been taken by Levine, Neal and Park, and also by Thelander and Pryn."⁹ Their findings tended to show no demonstrable differences in anatomical characteristics between controls and poliomyelitis patients. Aycock, however, supports Draper's work and expresses doubt as to whether the dissenting experiments were quite comparable in every respect to that of Draper's. He, in turn, goes one step further in his elaboration of the "poliomyelitis type" and in so doing introduces a new term, namely, autarcesis.

Autarceologic Susceptibility

By autarcesis, Aycock refers to those properties of resistance in the host which cannot be explained by the specific immunity due to formation of antibodies. He attempts to define and elaborate his theory of autarceologic susceptibility by approaching the problem along three individual yet interrelated methods of consideration; i.e., (1) the epidemiologic and genetic considerations, (2) anthropometric studies of individuals

attacked and (3) experimental attempts to influence the susceptibility of monkeys.³

Aycock first draws attention to the observation that though the virus appears to be widespread—resulting in cases throughout the world, only a small percentage of the population exposed to the virus actually develop paralytic poliomyelitis. Furthermore, "the paralytic disease is less prevalent in warmer latitudes and yet it uniformly reaches its highest incidence in the warmer months of the year."⁵ Such selectivities in occurrence suggest to him that autarceologic susceptibility is "associated with the failure on the part of a certain percentage of people to make adequate physiologic adjustments to varying climate and season."³

That this susceptibility to poliomyelitis infection is hereditary is suggested by various studies, all of which emphasize the fact that the clinical disease "runs" in certain families. In a survey of the incidence of poliomyelitis in families, Aycock pointed out that 51 per cent of the cases gave a history of the disease among relatives, while only 5 per cent of normal individuals gave a similar history.⁵ Again, in another survey, Swartout and Frank point out that of 721 patients admitted to the Los Angeles County Hospital, 9.29 per cent or sixty-seven came from families with multiple cases. These investigators suggest that better diagnosing of cases might reveal an even higher percentage of familial occurrences.³⁷

Further investigation by Addair and Snyder¹ tends to confirm the familial aspect of poliomyelitis. In their study, they present evidence for the existence of an autosomal recessive gene for susceptibility to paralytic poliomyelitis. Their survey covered twenty-nine individuals suffering from poliomyelitis residing in a portion of McDowell County, West Virginia. Genetic relationships were traced among all twenty-nine affected individuals. In fourteen of the cases, paralytic poliomyelitis could be traced both in the fathers and in the mothers pedigree, while in the remaining fifteen cases, affected individuals are demonstrated in the pedigree of only one parent. They point out that in families affected, one out of 5.5 individuals came down with paralytic poliomyelitis. This ratio is slightly smaller than expected with a recessive gene (one out of four usually affected) and therefore the gene appears to have a reduced penetrance. Such familial in-

cidence is further emphasized by the following description of the area affected. "This region is made up of mountains and valleys and so the families are more separated geographically than would be the case in flat country. The community as a whole was not highly inbred and the families affected lived in many different valleys and were often completely out of touch with one another. On the other hand, there were hundreds of families living among those affected in which no trace of paralytic poliomyelitis had occurred. It would seem therefore, that the familial aspect of poliomyelitis is pretty much of a surety.

Aycock concurs with Draper's doctrine that poliomyelitis tends to occur in individuals of a certain constitutional type. In a series of anthropometric studies on 109 poliomyelitis patients, in which he measured their span (arm length), their leg length and their body length, he found that they showed increased span, increased lower measurement and decreased body length as compared to normal.³ Such measurements, he believes, are indicative of endocrine differences and are suggestive of either relative hyperpituitarism or hypergonadism. It is interesting to note that these experimental studies tend to agree only partially with Draper's observations. Most of Draper's children were of the Froehlich type, i.e., hypopituitary cases. Draper's adults, however, revealed more of the acromegalic, i.e., hyperpituitary features. Both of these studies, however, indicate the presence of an endocrine imbalance in the "poliomyelitis type."

Autarceological susceptibility, says Aycock, does not lie only in a fixed anatomical characteristic but is more of a physiological irregularity and is evidenced by the inability of the poliomyelitis type to adapt himself to climatic and seasonal variations. He suggests that this "susceptibility may reside in an endocrine difference, more largely subclinical, but expressing itself as a frank endocrinopathy in a portion of the individuals affected and more particularly at certain periods of growth and development, irrespective of the age of the poliomyelitis attack, which is more directly a function of exposure to the virus."⁵

Aycock's third method of attack on the problem of autarceological susceptibility is through experiments with monkeys. In this manner, he attempts to discover not only the exact nature

of this endocrine imbalance but also its method of operation. Thus after administration of estrin to a group of twelve castrated immature female monkeys, he found that it enabled seven of these monkeys to survive the intranasal instillation of virus. The remaining five of the treated monkeys, though ultimately succumbing to the effects of the virus, seemed to display a longer incubation period than usual. On the other hand, ten other similar monkeys who did not receive estrin died rapidly from the effects of the virus. Furthermore, he notes, "It has been shown that castration of immature female monkeys (*Macacus rhesus*) results in thinning of the genital mucosa. The giving of estrogens to such animals effects a recornification of the genital mucosa and the nasal mucosa participates in these experimental changes."⁶ He therefore feels that changes in the nasal mucous membranes by alterations in the hormone secretion may well be the basis of increased susceptibility to the infection.

This concept, however, is also beset by apparent discrepancies. Thus Aycock found that pregnancy seems to be associated with poliomyelitis about four times as frequent as would normally be expected in non-pregnant individuals. Furthermore, a closer examination of this relationship reveals that it is only in the second and third trimester of pregnancy that an increased susceptibility occurs. The first trimester seems to display just the opposite effect for it appears to confer an increased immunity upon the host.⁴⁶ Aycock admits that the apparent increase of susceptibility in the later periods of pregnancy seems to be contradictory to his other experimental observations, for in pregnancy the estrogenic contents appear to be elevated. However, he draws attention to the fact that in pregnancy we have not one but several hormones, all of which may interact and produce a condition that is actually different than an increase in estrogen alone.⁷

Weaver likewise attempts to explain the apparent decrease in susceptibility during the first trimester and notes that "in pregnancy we have not only an elevation of estrogen and progesterone (which are present in normal individuals) but also an addition of a new substance called gonadotropin (anterior pituitary-like hormone)."⁴⁶ On the other hand, Jungeblut has found poliocidal substances in the serum of pregnant mares and states that this property is not present in all

pregnant mares but varies irrespective of the gonadotropic hormone titer of the serum.²³

It would seem, therefore, that many possibilities exist in pregnancy both as to combinations of different hormones and changes in the proportions of each hormone. More complete knowledge of their relationship is necessary before the variable effect of pregnancy on the susceptibility to poliomyelitis can be clearly understood.

In another experiment, Aycock was able to compare the amount of estrogenic substance excreted by chronic poliomyelitis patients with that excreted by normal individuals. He found a higher average excretion of estrogenic substance in the group of poliomyelitis patients. Such findings, he concludes, indicate that "autarcological susceptibility does not lie in a simple deficiency in the elaboration of estrogenic substance, but rather in some discrepancy in its economy."²⁵

Fraser, in his review of poliomyelitis¹⁶, criticizes Aycock's attempts to draw conclusions from the latter experiment for, he says, "estrogen excretion during the disease tells us nothing certain about the endocrine state before the disease which is the time when susceptibility exists if ever." Fraser forgets, however, that the acute phase of the disease was past. Most of these patients had come down with the disease as long as twelve months previously and were being treated only for the chronic residual effects of poliomyelitis. Thus unless the disease occasions a permanent effect on the endocrines, the state of their hormone relationships after an attack should be similar to that before the attack and the experiment could therefore be of significance. The occasional occurrence of second attacks of poliomyelitis seems to partially substantiate the latter point of view.³²

Studies made by various other investigators seem to further emphasize the role of the endocrines in autarcological susceptibility. Thus Jungeblut et al have observed that adrenal tissue hormones can cause the neutralization of the virus of poliomyelitis. They believe the virucidal factor here may be identical with the gonad stimulating hormone and may act by an "oxidative or hydrolytic destruction of virus, such as may occur with ferment-like metabolic substances."²⁶

Since adrenal hormones have been found to inactivate the toxin of diphtheria as well as the

virus of poliomyelitis, it is well to comment, at this time, on the relationship that seems to exist between the two diseases. Thus Heaslip suggested the possibility of a relationship in susceptibility to both diphtheria and poliomyelitis after noting that in a group of children of ages six to 12, 70.6 per cent of those affected with poliomyelitis were Schick positive while only 40.2 per cent of the controls showed a positive reaction.¹⁷ Further observations which suggest some common relationship between the two diseases are as follows: (1) placental extracts have been found to contain neutralizing principles against both poliomyelitis virus and diphtheria toxin; (2) immunization of monkeys with diphtheria toxoid or TAT mixture increased the resistance of nearly one-half of the animals in various degrees to subsequent poliomyelitis infection; and (3) studies by Perkins et al showed seasonal fluctuations of normal diphtheria antitoxin in adolescents. "This curve foreshadows, with fair precision, the rise and fall of poliomyelitis epidemics."²¹

Jungeblut suggests that the basis of this relationship may well be the common protective action furnished by the adrenal and pituitary hormones. For he notes that diphtheria toxin exerts an inflammatory effect on the adrenals and lesions in the anterior pituitary gland have been reported following diphtheria intoxication. Therefore, he asserts, it is conceivable that "such substances as diphtheria toxin, when introduced in small doses parenterally, initiate a characteristic stimulation of the endocrine system, which releases certain principles into the circulation and tissues." Thus, it seems, protection against one disease whether inborn or artificially acquired may be associated with some resistance against the other.²¹

Vitamins

Experiments have shown that certain of the vitamins are closely related to some of the endocrines and therefore may share in their protective action. Thus vitamin C has been found in large quantities in the adrenals and nerve tissue and like the adrenal hormone, it has been found able to inactivate both diphtheria toxin and poliomyelitis virus. Experimental work with monkeys seems to confirm the apparent protective action of vitamin C. Jungeblut observed that six times as many animals escaped paralysis follow-

ing the administration of natural vitamin C as did the corresponding controls. In this respect, he emphasizes that natural vitamin C was about three times as effective as the synthetic vitamin. It would seem therefore that there is greater need for the utilization of vitamin C during the height of a poliomyelitis infection and unless vitamin C is supplied in large quantities, the nerve tissue becomes more susceptible to the effects of the virus.²⁴ Heaslip tends to concur with Jungeblut's observations. He likewise points out that since there usually is a decreased excretion of vitamin C following infection, "it is probable that a low level of vitamin C nutrition predisposes to infection and severity of attack."¹⁸

Vitamin B deficiency has also been proposed as a major factor responsible for increased susceptibility to the effect of the virus. Helms, who is one of the more recent sponsors of this theory, reasons thus:¹⁹ (1) "Authorities consider the virus of poliomyelitis almost exclusively neurotropic and therefore the physiology of the nerve cell may determine its resistance to the virus; (2) Vitamin B is believed to be directly concerned in the physiology of the nervous system more than any other vitamin." Therefore, its deficiency would have a direct bearing on the patient's susceptibility to the paralytic effects of the virus. Helms goes on to compare beriberi, caused by vitamin B deficiency, with poliomyelitis and says they resemble each other in time of occurrence, male predominance and predisposition by muscular exercise. He points out that poliomyelitis is inclined to occur with greater frequency when the demands for vitamin B are great, as in childhood, pregnancy and after excessive muscular exercise. He concludes with the suggestion that "paralytic poliomyelitis occurs only when the bio-chemical state of the central nervous system is such as to favor the propagation of the virus and that hypovitaminosis B may be one cause of such a bio-chemical state."¹⁹

Weaver, however, in experimentation with cotton rats, was not able to confirm that increased intake of vitamin B complex had either a prophylactic or therapeutic effect in poliomyelitis.⁴⁵

Toomey, on the other hand, seems to feel that vitamin D deficiency is the prime factor promoting the occurrence of paralysis in poliomyelitis. He states that experimentally the virus does not ordinarily spread along well-myelinated nerves

of healthy *Macaca Mulatta* monkeys but that the virus will spread along nerves of vitamin D deficient monkeys if the virus is simply placed in contact with post ganglionic fibers. He presumes, therefore, that "in the latter animals, the preganglionic medullated nerve fibers to the adrenal gland are made deficient and hence are more susceptible."²⁰

We find, therefore, that there are many factors that can possibly affect the susceptibility of an individual and thus predispose him towards a paralytic conclusion if, perchance, he contacts the virus of poliomyelitis. All have some experimental confirmation and yet no one factor seems able to uniformly account for all the findings as they occur in human poliomyelitis. More probably, all have functions in the defensive mechanism of the body; functions operating not separately or individually but rather as interrelated and interdependent, and working harmoniously, when in their proper relationship, towards the protection of the body from its many parasitic invaders.

Summary

A review of the epidemiology of poliomyelitis has been presented and evaluated. Many controversial facts and opinions have been noted. Though no one concept seems to be without its discrepancies and weaknesses, the writer feels, at this time, that the epidemiology of poliomyelitis is more satisfactorily explained by the following observations and suggestions:

1. The etiological agent of poliomyelitis is a filterable virus which consists of many different strains.
2. The virus of poliomyelitis is widespread throughout the world.
3. The virus seems to be spread primarily by droplet infection in a person to person contact but other vectors such as insects may aid in its mechanical transmission.
4. Most individuals respond to virus contact by experiencing a mild or subclinical infection and so build up their latent immunity to the disease.
5. Paralysis in poliomyelitis is the unusual complication and seems to occur only in a very small percentage of the population affected by the virus.
6. The factors determining the occurrence of paralysis seem to be primarily in the non-specific phase of host immunity. These factors seem to

be hereditary and include constitutional and physiological variations from the normal. Such variations may exist as only very slight and inapparent differences, but may also occur as marked and easily recognized deviations from normal.

7. The endocrines and vitamins seem to be intimately associated with the production of this physiological susceptibility to the effects of the virus. The manner of their operation is still not clearly understood.

8. Though considerable more work needs to be done on all phases of its epidemiology, the outlook for a more uniform and clear understanding of poliomyelitis in the near future seems promising.

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LEPROSY

WILLIAM J. SIMON, B.A., D.D.S., M.S.D.,
Minneapolis, Minnesota

LEPROSY is a neoplastic disease caused by the *Mycobacterium Leprae* and is included in that group of diseases known as infective granulomas. According to the point of attack of the *Mycobacterium Leprae* (be it the skin or the nervous system), the disease assumes two clinical forms: (1) nodular leprosy, and (2) maculo-anesthetic leprosy. A mixed type also occurs.

Characteristics

The nodular type of leprosy is characterized by the formation of lumps or nodules in the skin about the face (Fig. 1). As this nodular infiltration progresses, the skin appears to thicken on the forehead, in the region of the eyebrows, on the lobes of the ears, and on the cheeks, nose, and lips producing the so-called "leonine" expression. Some of the nodules remain unaltered for long periods of time and may undergo spontaneous absorption. Other nodules may ulcerate and heal leaving depigmented scars.

The maculo-anesthetic type of leprosy is characterized by flat patches or macular lesions of the skin beginning on the extensor surfaces of the extremities. The skin at first is hyperesthetic because of the infection of the superficial nerve trunks. The invasion of the nerve trunks not only results in the loss of sensibility to touch, heat, and cold, but also produces trophic changes in various groups of muscles. The ensuing contractures of tendons produce the "lepers claw." Facial muscles undergoing atrophy give the features a "masklike" appearance. This type of leprosy is the most insidious.

The mixed type of leprosy in the earlier stages has the characteristics of the nodular type but later assumes the symptoms and characteristics of the maculo-anesthetic type.

Occurrence

From the references made in the Old Testament, there is evidence that leprosy occurred as long as two thousand years before the Christian

era. In parts of the Orient it probably has existed for thousands of years. However, historically, the leprosy of the Arabic peoples has been frequently confused with the elephantiasis of the



Fig. 1. The nodular type of leprosy is characterized by the formation of lumps or nodules in the skin about the face. (Courtesy of Colonel G. H. Faget, Medical Director and Medical Officer in Charge, U. S. Marine Hospital—National Leprosarium, Carville, Louisiana.)

Greeks. During the eleventh century a great epidemic began which swept through England and the continent. The Old English name given to the disease was "Myckle Ail" or "Great Disease." The segregation of the victims of the disease into leprosariums led to a wiping out of the scourge by the end of the sixteenth century. Though the disease is not as widespread as it was at one time it still occurs sporadically in all parts of the world. Leprosy is common in the southern Asiatic countries. It occurs frequently in the Mediterranean countries, Central America, and the Southwest Pacific Islands. Though it is now regarded as a tropical disease it has appeared in Norway, Iceland, Canada and the United States. In the United States foci exist in Minnesota, New York, South Carolina, Texas, California, and Louisiana. The United States Government main-

From the Division of Oral Diagnosis, University of Minnesota, Minneapolis, Minnesota.

Editor's Note: While the author was on active duty with the Army, he visited the Leprosarium located in the Assam Valley at Jorhat, India. This hospital, a Baptist mission, was under the supervision of Dr. C. V. Kirby.

tains leprosaria at Carville, Louisiana and on the island of Molokai in Hawaii. There can be no doubt that leprosy is contagious. However, it is not highly contagious, for only after long intimate contact can it be transmitted from one person to another. The susceptibility of exposed persons can be correlated with such predisposing factors as poor personal hygiene and unsanitary environment. Leprosy is found in all age groups but is more common in adults than in children. The incidence is about equal in the sexes during childhood. In adults the disease occurs more frequently in the male.

Diagnosis

The advanced case of leprosy cannot be mistaken for any other disease; however, the prodromal symptoms are those common to other infectious diseases and consist of pains in the muscles and joints, backache, headache, neuralgias, digestive disturbances, rhinitis, pruritus, and various disturbances of sensation. If the patient comes from a region where the disease is endemic, he should be examined in good light for any thickening of the skin or superficial nerve trunks and nasal lesions. The portal of entry of the organism, *Mycobacterium Leprae*, is not definitely known, although in many lepers the nasal septum seems to be the first site of attack. In fact, perforation of the nasal septum is not uncommon. While this observation implies transmission by inhalation the evidence is far from conclusive. In the advanced case of leprosy the actual diagnostic differentials are not difficult. Certain manifestations of syphilis, lupus vulgaris, mycosis fungoides, hemorrhagic sarcoma and of the comparatively rare annular syphilids may confuse the diagnosis. The scientific method of differentiation is the bacteriological diagnosis in the attempt to find the specific *Mycobacterium Leprae* in the scrapings of a discharging lesion or ulcer. In the advanced case the *Mycobacterium Leprae* may be found in all the viscera; however, one investigator found the organism in the blood of only nine out of twenty-eight lepers. Likewise the Wassermann test is frequently positive in nonsyphilitic lepers affected with nodular leprosy. The *Mycobacterium Leprae*, discovered by Hansen in 1873, resembles that of tuberculosis in respect to its morphology and reactions to stains. The histopathologic section of leprosy tissue resembles that of tuberculosis and syphilis

but the instances in which these diseases might obtrude the clinical diagnostic manifestations of leprosy are more hypothetical than a reality.

Oral Manifestations

Vignes reports that leprosy ulcers are found in the mouths of 41.33 per cent of the 372 patients in the National Leprosarium in Louisiana. This would indicate that oral manifestations are present in the well-advanced and recognized cases of leprosy which practically precludes the possibility of a dentist being called upon to make the original diagnosis of a new case even in an endemic area. In the chronic case of leprosy an oral examination will reveal the following conditions in whole or in part:

1. *Lips*: The nodular type of leprosy studying the lips is a painful lesion. Movement of the lips irritates the nodules which soon ulcerate. Severe ulcerations go on into necrosis. Ulcers which heal produce contractures and scars resulting in the so-called "buttonhole mouths." This may require surgical intervention in order to gain access into the mouth for dental restorations.

2. *Tongue*: The tongue may appear to be fully developed but, in instances, it may be tessellated like pavement blocks of different sizes with raised nodules set off by deep furrows. This is not particularly painful.

3. *Oropharynx*.—In the oropharynx, the uvula and the palatine pillars are the common site of the leprosy nodular lesion. In the maculo-anesthetic type of leprosy of the pharynx, paralysis of the soft palate and the muscles of mastication restrains speaking and swallowing not unlike a diphtheritic paralysis. Perforation of the soft palate occurs in some cases.

4. *Buccal Parieties*.—The nodular type of leprosy rarely occurs on the buccal parietes; however, in the maculo-anesthetic type any portion of the buccal parietes may be involved anesthetically either unilaterally or bilaterally and indicates affection of either the trigeminal or facial nerves or both. Lesions of the buccal parietes when appearing are frequently associated with leukoplakia.

5. *Gingiva*.—Gingivitis occurs in the nodular, maculo-anesthetic and mixed types of leprosy although it is the most common in the nodular

type. Nodules in the gingival tissue give the appearance of hypertrophic gingivitis. The gingival tissue lingual to upper anterior teeth is an area frequently involved.

6. *Alveolar Process*.—In the advanced case of the mixed type of leprosy, resorption of an alveolar process occurs primarily involving the premaxilla. This is observed radiographically and is also reported to occur beneath dentures.

7. *Teeth*.—The teeth are not affected, although they become loosened and the hypertrophic characteristics of the lesions give the teeth a buried appearance. Leprosy is not hereditary and an inherited predisposition to it has never been demonstrated.

Treatment

Leprous patients with excoriations, ulcers and secreting wounds are very apt to contaminate immediate surroundings and hence should be strictly segregated. Many remedies have been attempted unsuccessfully; however, some patients improve after long continued ingestion of chaulmoogra oil. Some promising results have been obtained from the injection of the ethyl ester of the fatty acids of chaulmoogra oil over prolonged periods—two, three, or even five years—with intervening periods of rest. For the past five years interest has centered on the sulfones. Of these the most thoroughly investigated is Promin. Faget, et al., regard Promin as "the most encouraging experimental treatment ever undertaken at the National Leprosarium" (Fig. 2). While there is no direct evidence that Promin exerts a specific bacteriostatic or bactericidal action against *Mycobacterium Leprae*, it does appear capable of inhibiting the progress of leprosy in a considerable percentage of cases.

Conclusion

As long as the state of Minnesota is reportedly a foci for leprosy and now that men and women of the armed forces are returning from areas of endemic leprosy it may well become the opportunity of a dentist to recognize the prodromal syndrome of leprosy, for the period of incubation for leprosy is extremely variable. It may be several

months or years. Wise reports that in one of his patients the period of incubation was estimated to be twenty-three years.



Fig. 2. This is the face of the leprosy patient shown in Figure 1 after a period of approximately one year's therapy with Promin. Improvement is obvious but smears are still positive for *Mycobacterium Leprae*. (Courtesy of Colonel G. H. Faget, Medical Director and Medical Officer in Charge, U. S. Marine Hospital—National Leprosarium, Carville, Louisiana.)

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SURGICAL TREATMENT OF THROMBOPHLEBITIS

JOHN R. PAINE, M.D.

Chief of Surgical Service
University of Minnesota Medical School
Minneapolis, Minnesota

THE last five years have seen a great increase in the interest of both surgeons and internists concerning the old problem of thrombophlebitis of the lower extremities and pulmonary emboli. It is now well known that these conditions are not confined to postoperative surgical patients but are seen equally as often in non-surgical patients.

Hunter, in 1945, in a carefully studied series of cases has found that approximately 50 per cent of all patients beyond middle age develop thrombi in the deep veins of their lower legs if they remain in bed for more than a few days. The incidence is much lower in younger patients but other predisposing factors are such that the possibility of intravenous clotting of blood can not safely be overlooked in any adult patient. Figures purporting to express the actual incidence of thrombophlebitis vary over a fairly wide range, but at least 1 to 2 per cent of all major operations are followed by the development of thrombosis in the convalescent period. Of those patients who develop a recognizable thrombophlebitis, 5 per cent will die of a pulmonary embolus if untreated. The importance of this condition for the surgeon is further emphasized by the fact that about 5 per cent of all deaths following operation are due to pulmonary emboli.

Homans, in 1934, was the first to distinguish between two distinct types of thrombi in the deep veins of the lower extremities. One type, which he called the "bland thrombus" is accompanied by few, if any, clinical signs or symptoms other than a slight rise in temperature and pulse. Such a thrombus is but loosely attached to the intima of the vein. The other type is that present in the classical milk leg in which thrombus formation is accompanied by a marked reaction in the wall of the vein which secures it and in most instances prevents the occurrence of embolism. The signs and symptoms of this type of thrombus are pain and swelling with pallor of the affected part accompanied by a moderate increase in the temperature and pulse rate. Homans recognized the greater potentiality of the bland thrombus as the

source of pulmonary emboli and recommended that in such cases, the superficial femoral vein in the affected extremity might well be ligated.

Ochsner and DeBakey have further distinguished the bland thrombus from the thrombus associated with an inflammatory reaction. To the former they gave the name "phlebothrombosis" and for the latter retained the term "thrombophlebitis." Their studies have clearly shown that most of the signs and symptoms of thrombophlebitis are due to a reflex vasospasm of arterioles which can be relieved effectively by the injection of novocaine to block the lumbar sympathetic ganglia. This method of treatment was first used in Europe by Leriche and his colleagues but Ochsner and DeBakey have advocated and popularized its use in the United States.

The recent discovery of dicumarol and its adaptation for clinical use with or without heparin has given the clinician a new means of treating both phlebothrombosis and thrombophlebitis. This phase of the problem will be considered by Dr. Barker who is better qualified to discuss it than I am.

Following Homan's recommendation that the superficial femoral vein be ligated in certain cases of thrombosis of the deep veins of the lower extremities, several years passed before doctors in general recognized the value of this simple procedure. Even at the present time the ardent advocates of this procedure are for the most part in Boston.

In 1941, Sears of the Beth Israel Hospital in Boston reported ten cases in which the superficial femoral vein had been ligated. He recommended that the vein be opened before ligation and any unattached thrombus present at that level be removed with suction. If a thrombus adherent to the vein at that point was encountered it was to be divided with the vein.

The following year, Fine, of the same hospital went one step further and recommended that the common femoral vein be ligated in any case in which the signs and symptoms of a thrombus were obvious or if a filling defect in the veins could be demonstrated by a venogram in cases of

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doubt. The common femoral vein was preferred over the superficial femoral vein due to the occasional occurrence of a pulmonary embolus originating in the profunda femoris vein.

Allen, of the Massachusetts General Hospital, in 1943, reported 279 ligations of veins in 202 patients with 211 of these ligations being performed in 1942.

The early proponents of thrombectomy included L  wen, Kulenkampf and Lange in Europe and Ochsner in the United States. Lange advocated the suture of the vein wall, thus restoring its patency after removal of the thrombus, but the others have felt that the vein should be ligated, and this is now the accepted practice. The procedure of thrombectomy while open to such theoretical dangers as dislodgement of a portion of the thrombus due to manipulation would seem in practice to be relatively easy and safe, provided the patient is operated upon in a semi-reclining position so that the flow of blood in the proximal portion of the vein is in a retrograde direction. Unattached thrombi are easily removed by the suction tip or forceps. Attached clots are much less easily removed and probably much less effectively. As previously mentioned, these clots are much less likely to be the source of an embolus and for that reason the propriety of attempting their removal can well be questioned.

In 1945 Bancroft of New York reported twelve instances of thrombectomy from the iliac veins with the administration of anticoagulants after the operation. In the same year, Parsons of Vicksburg also recommended the combination of ligation plus dicumarol.

Veal and Hussey in 1945 reported on their experiences in ninety-eight vein ligations in eighty-four consecutive cases. In nine patients pulmonary embolism occurred after ligation but all of these patients had had emboli prior to their ligations. It was the authors' opinion that in eight of these nine patients, the post ligation emboli were due to inadequate surgical treatment.

In a recent editorial in the periodical, *Surgery, Gynecology and Obstetrics*, Allen of Boston has summarized the experience of the Massachusetts General Hospital in the surgical treatment of thrombophlebitis up to August 1, 1945. Eight hundred sixty-one patients have been treated by ligation. The vena cava was ligated in fourteen instances and only two of these patients have developed a chronic edema of the legs with ulcer-

ation of the lower legs. He recommends the ligation of the superficial femoral vein of both legs in the usual case inasmuch as only one instance of a fatal embolus from the profunda femoris vein was noted in the entire series. In Allen's opinion, 6 per cent of the patients having infarcts of the lung before ligation will have additional infarcts of the lung afterwards. One hundred elderly patients have been subjected to prophylactic bilateral ligation of the superficial femoral veins.

Such reports as I have mentioned may seem somewhat extreme to many of us and certainly give cause for pause and thought to those of us who are responsible for the practical management of large numbers of patients and the training of surgeons.

The clinician is faced with the situation in which he has three methods of treatment, each with its advocates. What we as doctors must do is to realize the shortcomings of each of these methods and if possible to come to some understanding of the indications for the use of each method or for the use of a combination of them. In this experimental or trial stage of the newer methods of treatment of thrombophlebitis and phlebothrombosis it will be best if we keep our minds open and realize that any conclusions reached must be more or less tentative for the present.

Each of these methods has its advantages and disadvantages, some theoretical perhaps, but others definitely practical. For instance, lumbar sympathetic block would seem to be most indicated in those instances of thrombophlebitis where the symptoms secondary to vasospasm are most marked and where the adherent nature of the thrombus minimizes if it does not nullify the danger of producing an embolus by increasing the blood flow. There is a variable but definite amount of discomfort to the patient incident to these injections, and the inconsistency in the results due to inaccurately placed injections definitely decreases the usefulness and efficiency of this method in the hands of the average doctor. On the other hand, it must be admitted that if performed properly no other means of treatment brings as quick and dramatic relief to the patient with a severe milk leg.

The advocates of the use of dicumarol claim that it is effective in both phlebothrombosis and thrombophlebitis. They claim it is safe if the dosage is carefully adjusted and if the prothrombin time is accurately and frequently checked

against controls. Whether or not the laboratory facilities available to him are of sufficient excellence to warrant the use of dicumarol is a question which each practitioner must decide for himself. The speaker would guess that such a situation would be the exception rather than the rule for most of us. Furthermore, dicumarol does not entirely prevent pulmonary emboli and while it may prevent the further propagation of a thrombus during its administration, thrombi are prone to form in susceptible individuals when its administration is stopped. In addition, 5 to 10 per cent of patients receiving dicumarol in therapeutic dosage are subject to spontaneous hemorrhages.

The advocates of thrombectomy and ligation and division of the deep veins draining the lower extremities emphasize the fact that emboli originating distal to the point of ligation are absolutely prevented. Approximately 6 per cent of patients so treated, however, will have emboli after ligation if only one leg is operated upon and if they had emboli before ligation. The source of these emboli has been assumed in most cases to be from the opposite leg if only one vein was ligated. In some instances the source of further emboli may be from the internal iliac venous system or from the ligated vein proximal to the point of ligation. The inability of the operator to be sure that the ligated vein is the only source for an embolus has been the reason why bilateral ligation is now being more frequently performed. The operation of thrombectomy and ligation of the superficial femoral or common femoral vein with local novocaine anesthesia would seem to be a perfectly safe and technically easy operation. The same cannot be said of ligation of the iliac veins or of the vena cava, which require a general or spinal anesthesia with an abdominal incision and a fairly extensive retroperitoneal dissection. Such an operation cannot be advocated routinely for any group of sick patients without an evaluation of the risks present in each individual case.

Fear of disability from prolonged swelling following ligation of the superficial or common femoral vein is probably not well founded. All are agreed that no permanent swelling follows ligation of the superficial femoral vein. Swelling after the ligation of the common femoral vein is greater in degree and of more frequent occurrence. Fine believes that swelling developing after the ligation of a vein is largely proportional to

the swelling present before the ligation. Dennis has reported one case in which swelling of catastrophic proportion requiring fasciotomy resulted after ligation of the common femoral vein.

The point of ligation will depend somewhat on the attitude we take toward thrombectomy. Certainly ligation should be performed proximal to the end of the thrombus if the thrombus cannot be removed or is not removed. In cases with unattached thrombi, that portion of it lying proximal to the point at which a vein is opened prior to ligation can be easily removed by forceps and suction with a minimum of danger. Adherent thrombi can be removed in this manner much less easily and probably much less effectively.

During the past thirty months at the University of Minnesota Hospitals, fifty-eight cases of thrombophlebitis or phlebothrombosis were diagnosed clinically. All three previously mentioned methods of treatment were employed either singly or in combination in treating these cases.

FIFTY-EIGHT CASES OF THROMBOPHLEBITIS AND PHLEBOTHROMBOSIS

November 1944 to May 1946

University of Minnesota Hospitals

Ligation	15 (7 of these were also treated with dicumarol)
Dicumarol	35 (7 of these were also treated by ligation)
Lumbar sympathetic ganglia block. 20 (7 of these were also treated with dicumarol and 3 by ligation)	
Expectant treatment	5

Nine of these fifty-eight patients had a thrombophlebitis of the saphenous major vein or its tributaries. Ligation of the proximal end of the vein was carried out in each instance. In only six instances were deep veins of the lower extremity ligated. These were as follows:

Common femoral vein (on one side)	2 cases
Common femoral vein (on both sides)	1 case
Superficial femoral vein (on one side)	1 case
Superficial femoral vein (on both sides)	2 cases

Five patients in the total group of fifty-eight patients died. Two died from septicemia secondary to a septic thrombophlebitis. One died from rupture of an aneurysm and one as the result of cardiac decompensation following a pulmonary infarct and the administration of dicumarol. The fifth patient died following the drainage of a subphrenic abscess.

During the same period seven other patients died suddenly as the result of pulmonary emboli secondary to unrecognized thrombi.

Certain patients will be seen from time to time in which even the most careful observation and assiduous treatment may prove insufficient to save the patient from disaster. For example:

A fifty-six year old man was admitted to the Minneapolis Veterans Hospital March 18, 1946. He gave a history of having struck his left shin on a bath tub March 6. Several days later he noted that his left calf seemed hot and sore. The following day he experienced a severe sudden pain in his left lower chest and began to cough. He did not consult a physician, however, and by March 13 felt better. On March 18 he again experienced a sudden severe pain in his chest, this time on the right side and raised bloody sputum. He consulted his local doctor who made a diagnosis of pneumonia and referred him to the hospital.

After examination at the hospital a diagnosis of thrombophlebitis of the left leg with multiple pulmonary emboli was made and on the evening of the day of admission, the left femoral vein was explored. An adherent thrombus was found extending beyond the inguinal ligament, so the iliac vein was exposed in the retroperitoneal space. The thrombus was found to extend up to the bifurcation of the common iliac vein. Here the external iliac vein was divided and ligated.

Heparin by intravenous injection was started immediately as well as dicumarol by mouth. The heparin was discontinued after forty-eight hours but the dicumarol was continued for four days more until a spontaneous hemorrhage in the right gluteal region caused it to be discontinued.

On April 3, 1946, a third pulmonary infarction occurred and although the right leg was free of symptoms and appeared normal, the right common femoral vein was explored. This vein contained no thrombus but was divided and ligated.

On the following day a fourth pulmonary embolus occurred which caused death in a few minutes. At post-mortem examination the site of formation for at least the final embolus was found to have been the left internal iliac vein.

Summary

Two types of intravascular clotting are now recognized and three new methods of treating these conditions have been proposed. Homans was the first to appreciate the value of ligating thrombus containing veins of the lower extremities in the treatment of these conditions. Ochsner and DeBakey have popularized the treatment of thrombophlebitis of the lower extremities by novocaine block of the lumbar sympathetic ganglia. Dicumarol has recently been recommended for use in both phlebothrombosis and thrombophlebitis.

Each of these methods has its advantages and disadvantages. The present would seem to be a stage of experiment and trial for these newer methods of treatment. The experience of the University of Minnesota Hospitals during the past thirty months includes only fifteen patients treated by ligation.

On the basis of the writer's own limited experience, combined with that of others as reported in the literature, it is proposed tentatively to treat cases in the future as follows:

1. Thrombophlebitis of the deep veins of the lower extremities by repeated blocks of the lumbar sympathetic ganglia.
2. Phlebothrombosis of the deep veins of the lower extremities by ligation of the superficial femoral vein of the involved side with removal of all thrombus extending proximal from this point.
3. Thrombophlebitis or phlebothrombosis of the saphenous major vein or its tributaries by ligation of the terminal portion of the vein.
4. Thrombophlebitis or phlebothrombosis by ligation of the veins of both legs proximal to the level of any remaining thrombus and the administration of dicumarol.

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ANTICOAGULANT THERAPY IN POSTOPERATIVE THROMBOPHLEBITIS AND PULMONARY EMBOLISM

NELSON W. BARKER, M.D.
Division of Medicine, Mayo Clinic
Rochester, Minnesota

THE purpose of anticoagulant therapy is to prevent intravascular thrombosis and thereby to prevent embolism. It would seem logical to assume that in order to prevent thrombosis under all conditions it would be necessary to render the blood totally incoagulable for prolonged periods but obviously this would involve considerable risk. Considerable clinical experience indicates that it is necessary only partially to interfere with the coagulating mechanism, as indicated by coagulation tests of the blood *in vitro*, in order to prevent postoperative venous thrombosis.

As far as is known, anticoagulant therapy has no effect on a thrombus which already exists in a vein. Therefore, it may be asked, what is the rationale for giving anticoagulant therapy to prevent embolism when the thrombus already exists? The answer is that there is considerable clinical and pathologic evidence to indicate that by the time clinical evidence of thrombosis in veins of the calf of the leg or in an iliofemoral vein is sufficient to permit the diagnosis to be made, the thrombus is adherent and will not become detached.⁵ The danger of embolus in these cases lies in the fact that the patient has demonstrated a tendency to thrombosis and therefore is liable to extension of thrombosis in a proximal vein or to fresh thrombosis in some distant vein. These secondary thrombi may become detached and form emboli while they are still fresh and, theoretically at least, they can be prevented by anticoagulant therapy. Practically, if postoperative thrombophlebitis has developed, and if adequate anticoagulant therapy has been administered, pulmonary embolism does not develop; this is further evidence that only a fresh thrombus, which means one that is minutes, hours or, at the most, one or two days old, will become detached and cause embolism.

Postoperative pulmonary infarction, or non-fatal pulmonary embolism without clinical indication as to its source, occurs three-fourths as commonly as does postoperative thrombophlebitis,^{4,5} and is three times as likely to be followed, at a

later date, by fatal pulmonary embolism. In these cases it is obvious that the second embolism is caused by a new thrombus and, theoretically and actually, the second embolism could have been prevented if anticoagulant therapy had been started soon after the first embolus had occurred.

Patients who give histories of having had thrombophlebitis or pulmonary embolism under any circumstances, and at any time prior to a surgical operation, are known to constitute greatly increased risks from the standpoint of the likelihood of postoperative thrombophlebitis and pulmonary embolism. Anticoagulant therapy, as a prophylactic procedure, is rational and advisable in this group of cases.

If adequate anticoagulant therapy will prevent postoperative venous thrombosis, it would seem logical to give it always in the immediate postoperative period. At present this is impracticable and hardly justifiable. Venous thrombosis afflicts only about 1 per cent, and fatal embolus only about 0.2 per cent, of unselected patients who have been subjected to operation.³ Special supervision and at least one daily blood test are necessary when anticoagulant therapy is being used and there is a small risk of bleeding even with the best therapeutic technic. However, some patients who never have had thrombosis can be considered to present increased risk of postoperative thrombophlebitis and pulmonary embolism. The presence of obesity, varicose veins, heart disease, anemia, infection or a malignant neoplasm indicates an increased risk of postoperative thrombosis and, for patients who have these conditions, prophylactic anticoagulant therapy may be justified.

The danger of bleeding during postoperative administration of anticoagulants, particularly dicumarol, has been overemphasized. This danger is minimal if the drugs are used carefully and with proper individualization of dosage in each case. It must be remembered that the purpose is to impair coagulability of the blood definitely but not to render the blood totally uncoagulable. At the Mayo Clinic, widespread ecchymoses or hem-

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orrhages as the result of use of anticoagulants have not been encountered postoperatively. Minor bleeding, in the form of localized ecchymosis in the skin, transient epistaxis or microscopic hematuria

sufficiency should not receive dicumarol because, in such cases, the anticoagulant effect of ordinary initial doses may be excessive, greatly prolonged and difficult to control. (2) Patients with blood

TABLE I. INCIDENCE OF BLEEDING AMONG PATIENTS TREATED POSTOPERATIVELY WITH DICUMAROL.

Reasons for giving Dicumarol	Total patients treated	Minor bleeding		Major bleeding	
		Number	Percent	Number	Percent
Postoperative pulmonary embolism	292	6	2.1	3	1.0
Postoperative thrombophlebitis	280	10	3.6	3	1.1
History of thrombosis or embolism at any time prior to immediate operation (prophylaxis)	114	2	1.7	1	0.9
Abdominal hysterectomy (prophylaxis)	716	25	3.5	15	2.1
Other operations (prophylaxis)	284	10	3.5	10	3.5
Total	1,686	53	3.1	32	1.9

has occurred rarely. Serious bleeding has been even more rare. If serious bleeding has occurred, almost always it has been from the operative site, around drainage tubes in operative wounds, around duodenal tubes or around indwelling catheters. As a rule it has been encountered only in a few of the cases wherein an excessive anticoagulation effect has been produced. Very rarely has it taken place when impairment of coagulation was adequate but not excessive. The actual incidence of postoperative bleeding among a large series of patients who have received dicumarol at the Mayo Clinic is given in Table I. It will be noted that the incidence of bleeding was definitely less among patients who had thrombosis or embolism at any time than among those who never had had thrombosis or embolism. Two patients who received dicumarol died of hemorrhage from the operative site. Neither of these ever had had thrombosis or embolism and in both cases there is some doubt that the prothrombin deficiency produced by dicumarol was a factor in the bleeding. In one case the bleeding occurred early after administration, and before much anticoagulant effect had developed and, in the other case it occurred late, when the anticoagulant effect had almost subsided. At the clinic, fatal bleeding has not developed in any case in which postoperative thrombosis or embolism has occurred and in which dicumarol has been administered.

There are certain contra-indications to the use of anticoagulants, particularly to the use of dicumarol: (1) Patients with renal or hepatic in-

dyscrasias in which there is a tendency to bleeding, and patients who have purpura of any type or subacute bacterial endocarditis, should not be given anticoagulants because of greatly increased risk of widespread hemorrhage. (3) Patients who recently have undergone operations on the brain or spinal cord should not be given anticoagulants, not because the tendency to bleed will be increased, but because of the gravity of even a small hemorrhage at the operative site.

Patients who have ulcers, open wounds or exposed granulating surfaces present an increased risk of bleeding from these lesions if they are given anticoagulants. However, the risk is not prohibitive. More caution is required than is necessary in the absence of the conditions named but, if the patient has or has had thrombosis or embolism, the danger of fatal embolism may be much greater than the danger of serious hemorrhage. As has been said in part before, if drainage tubes have been left in wounds, in the renal pelvis or in the common bile duct, or if an indwelling catheter is in use or a duodenal drainage tube has been inserted through the mouth or nose and is still in place, the irritation of tissue about the tube causes a somewhat increased risk of bleeding but the risk is not prohibitive. Patients with nutritional deficiency may be unusually sensitive to dicumarol.

In the foregoing paragraphs, dicumarol has been mentioned. This substance and heparin constitute the two effective anticoagulant drugs now available. Heparin acts rapidly and the effect sub-

sides within a few hours after administration has been discontinued. Heparin, however, is expensive and the technique of its administration is time consuming. It is effective only when given intravenously or intramuscularly. Intramuscular administration in a slowly absorbed medium has been recommended but such administration is painful; furthermore, bleeding may take place at the site of injection and the effect is difficult to regulate.

There are two methods for intravenous administration of heparin. The first is the continuous intravenous drip technic whereby 200 mg. of heparin are added to 1,000 c.c. of diluent (either 0.9 per cent sodium chloride solution or 5 per cent glucose solution) and administration of the dilute solution is begun at the rate of 25 drops per minute. The number of drops per minute is then varied by adjusting the clamp on the tube so that the coagulation time of venous blood in a glass tube is maintained at between fifteen and twenty-five minutes. It is necessary to determine the coagulation time every six hours at first, and every twelve hours subsequently, in order to be sure that the proper effect is maintained. The second method of intravenous administration of heparin is to give frequent injections of a fixed amount of a concentrated solution. No determinations of coagulation time are made. In Sweden, a commonly employed dosage is 100 mg. every six hours. At the clinic 50 mg. every four hours have been used. This method does not take into account individual differences in tolerance to heparin. It produces almost total incoagulability of the blood for approximately one hour after each injection and there is a variable period just before each injection when the coagulation time has returned to normal. However, it appears to be effective in prevention of thrombosis. If heparin is to be administered for long periods, such as seven to fourteen days, the continuous intravenous method is preferable. For periods of one to three days, intermittent intravenous injections are preferable.

Dicumarol produces its anticoagulant effect by producing a prothrombin deficiency. It is effective when administered by mouth and it is cheap. The anticoagulant effect of dicumarol is delayed for one to three days after administration has been started and the effect persists for two to several days after administration has been discontinued.¹ Thus, it does not give immediate protection

against thrombosis; furthermore, if bleeding should occur, it is less easy to stop the anticoagulant effect than when heparin is employed. Since there is much variation in individual sensitivity to dicumarol, it is absolutely necessary to determine the prothrombin time (Quick) every day and thus to keep informed concerning the effect of the drug and the necessary dosage. The reports of prothrombin time must be consistent and comparable from day to day. To this end it is necessary to use a thromboplastin of consistent potency. Since thromboplastins used in different clinics and hospitals may be of variable potency, and since thromboplastins prepared by the same technique also may vary, it is advisable that the potency of any thromboplastin used in determinations of prothrombin time, as a guide to dosage of dicumarol, be established frequently. Reports of prothrombin time preferably are expressed as per cent of normal prothrombin.⁹ These values, calculated in seconds and converted into percentages, can be determined for any thromboplastin by ascertaining the prothrombin time for undiluted normal plasma and for normal plasma diluted to various concentrations with 0.9 per cent sodium chloride solution, or preferably diluted with prothrombin free plasma. The important prothrombin times to know for any thromboplastin are those for 100 per cent, 30 per cent, 20 per cent and 10 per cent normal plasma.

The simple schedule of dosage for dicumarol, which has been used successfully at the clinic for more than four years, is as follows. The entire amount for one day is given in a single dose. The first dose is 300 mg. Thereafter, 200 mg. are given on each day that the value for prothrombin is greater than 20 per cent of normal prothrombin. On days that the value for prothrombin is less than 20 per cent of normal no dicumarol is given. If the value for prothrombin falls below 10 per cent of normal and remains there for more than one day, indicating more than usual sensitiveness to dicumarol, 20 to 30 mg. of menadione bisulfite are given intravenously and thereafter only 100 mg. of dicumarol are given to that particular patient on days when the value for prothrombin is greater than 20 per cent of normal. If severe bleeding occurs, an intravenous injection of 60 mg. of menadione bisulfite, and one or more transfusions of 500 c.c. of freshly drawn citrated blood, are given daily until bleeding ceases.

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For several years dicumarol has been used almost entirely instead of heparin as an anticoagulant at the clinic because of its cheapness and the simplicity of its administration. Heparin oc-

bulatory several days and has been dismissed from the hospital. It is not necessary, because patients are receiving anticoagulant therapy, to keep them in bed longer than usual. Ordinarily,

TABLE II. NONFATAL POSTOPERATIVE PULMONARY EMBOLISM AND INFARCTION

	Control group; ⁴ anticoagulants not administered		Dicumarol administered	
	Number	Per cent	Number	Per cent
Total cases	678	100	292	100
Subsequent venous thrombosis, pulmonary embolism or infarction	297	43.8	3	1.0
Subsequent fatal pulmonary embolism	124	18.3	1*	0.3

*After prothrombin had returned to normal.

TABLE III. POSTOPERATIVE THROMBOPHLEBITIS

	Control group; ⁵ anticoagulants not administered		Dicumarol administered	
	Number	Per cent	Number	Per cent
Total cases	897	100	280	100
Subsequent venous thrombosis, pulmonary embolism or infarction	227	25.3	8*	2.8
Subsequent fatal pulmonary embolism	51	5.7	0	0

*One case of minor pulmonary infarction and seven cases of thrombophlebitis in three of which the value for prothrombin was greater than 30 per cent when the recurrence developed.

casionally is given by intermittent intravenous injection in addition to dicumarol for the first few days, to cover the period between institution of treatment with dicumarol and development of adequate prothrombin deficiency. In such a case, administration of heparin is stopped when the value for prothrombin is less than 20 per cent of normal. The blood for this test should be withdrawn four hours after an injection of heparin has been given. This combination of heparin and dicumarol is theoretically the best anticoagulant therapy. However, at the clinic it has been used only in the postoperative period, in the presence of severe pulmonary embolism and associated shock or cardiac embarrassment. In spite of the lag in effect, the use of dicumarol alone has been effective in cases of thrombophlebitis and in the presence of small pulmonary infarcts.

Anticoagulant therapy for postoperative thrombophlebitis or pulmonary embolism should be begun as soon as the diagnosis has been made and should be continued until the patient has been am-

and unless there is another reason for keeping them in bed, they are allowed up as soon as the signs and symptoms of pulmonary embolism or thrombophlebitis have subsided; this usually is seven to twenty days after the onset of the complication. When given prophylactically, anticoagulant therapy should be started on the second or third postoperative day.

The effectiveness of heparin as an anticoagulant in the treatment and prevention of postoperative venous thrombosis and pulmonary embolism has been attested by several reports.^{6,7,11,12} The effectiveness of dicumarol as an anticoagulant for the same purpose, in 1,288 cases encountered at the Mayo Clinic is shown in Tables II, III, and IV. The 1,288 cases include 756 cases previously reported² and 532 cases not previously reported. It is significant that in the entire group there has been only one fatal pulmonary embolism and this occurred more than a week after administration of dicumarol had been stopped and the prothrombin had returned to normal. The cases of

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thrombophlebitis include all those in which a clinical diagnosis was made and the lesions were in various veins: iliofemoral, long and short saphenous, and deep veins of the calf of the leg.

venous thrombosis develops and (3) those in which there is a history of thrombophlebitis or pulmonary embolism having occurred prior to the immediate operation.

TABLE IV. ABDOMINAL HYSTERECTOMY

	Control group: ³ anticoagulants not administered		Dicumarol administered prophylactically	
	Number	Per cent	Number	Per cent
Total cases	5,370	100	716	100
Any venous thrombosis or pulmonary embolism	230	4.3	2*	0.3
Fatal pulmonary embolism	42	0.7	0	0

*Both minor thrombophlebitis only.

They also include those in which there was maximal or minimal periphlebitic reaction, many of which might have been called cases of phlebotrombosis by those who make such a distinction. Lehmann and Evans also have reported good results with dicumarol in treatment of postoperative venous thrombosis and pulmonary embolism in fairly large series of cases.

Summary

Anticoagulant therapy with heparin or dicumarol is effective in the prevention of postoperative thrombosis and embolism and in prevention of further thrombosis, and therefore of embolism, in cases in which one or both of these complications already have occurred. If anticoagulants are properly given, the risk of serious bleeding is minimal and, if such bleeding occurs, it almost always can be controlled easily. At the Mayo Clinic it is felt that anticoagulant therapy with dicumarol, and occasionally with additional preliminary administration of heparin, is the treatment of choice for prevention of postoperative pulmonary embolism in the following groups of cases: (1) those in which one nonfatal pulmonary embolism or pulmonary infarct develops; (2) those in which clinical evidence of thrombophlebitis or

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NEONATAL DEATHS FOLLOWING TERM DELIVERIES, 1937-1945

Cause and Effect Relationships

ROY W. DICKMAN, B.S., B.M., M.D.

Duluth, Minnesota

GREAT strides have been made the last few years in reducing infant mortality, yet there has been little or no change in infant mortality under two weeks of age. It has been very disturbing while on the very active obstetrical service at St. Mary's Hospital to see newborn infants appearing perfectly normal, whose heart sounds were good during labor, whose umbilical cords were pulsating when born, yet, who died because initiation of respiration could not be accomplished. An investigation of these cases was then undertaken to attempt to determine causes of newborn mortality within St. Mary's Hospital. A complete review of newborn deaths since 1937 was undertaken. It was not possible to check charts before 1937 since at that time Standard Nomenclature cross-indexing was started here. A review of the literature was then completed and correlated with our findings.

Difficulty was encountered in reviewing the cases since many were inadequate and incomplete in the following factors:

1. Incomplete records of length of the 1st and 2nd stages of labor and incidents relating to labor.
2. Incomplete records of length of time that anesthetics were used, what stage of anesthesia patient was in and whether patient was ready to deliver but was anesthetized until doctor's arrival.
3. Exact time from birth until child took his first breath and the length of time each method of resuscitation was used.
4. Whether any method was used to prevent delivery until doctor's arrival.

Table I shows the form followed to investigate fetal deaths. Both the mother's record and the baby's record were studied in each case. Prematures were classified as those under 2500 gm. or from 35 to 47 cm. in length, with length taking precedence over weight. Usually, the attending physician's classification of prematurity was taken.

A liveborn was considered as one in which there was any sign of fetal life such as heart beat, or respiration attempts, or pulsating umbilical cord.

From the Department of Obstetrics, St. Mary's Hospital, Duluth, Minnesota.

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TABLE I. POINTS COVERED IN THE ANALYSIS OF NEONATAL DEATHS

Gravida of the mother	Anesthesia for delivery
Prenatal care	Type of delivery
Artificial rupture of membranes	Difficulty in resuscitation of baby
Pituitrin	Methods of resuscitation used
How much given	Artificial respirations
When given	Contrast baths
Hykinone	Coramine
Time and amount of medication given predelivery	Adrenalin
Nembutal	Lobeline
Seconal	Caffeine sodium benzoate
Morphine sulfate	Digitalin
Demerol	Oxygen
Sodium pentothol	Carbon dioxide
Dilaudide	Condition of baby at birth
Scopolamine	Type of monstrosity
Length of labor	Length of life
	Clinical cause of death
	Pathological report

TABLE II. PERCENTAGE OF FULL-TERM AND PREMATURE DEATHS

	No. of Births	Stillborn %	Term death %	Premature death %
St. Mary's Hospital	9,053	1.9	.93	14.57
Chicago Lying-In ¹⁴	17,728	2.3	.80	18.1

The total number of births from January, 1937, until November, 1945, was 9,053. The number of living term births was 8,537, and there were 516 premature births. There were 80 deaths in full-term deliveries or .93 per cent, and there were 141 premature deaths or 27.32 per cent. The number of neonatal deaths for the total period was 221 of which 36.19 per cent were full-term babies and 63.8 per cent were premature. The number of stillborns for the total period was 177, a grand total of 9,230 deliveries of which 1.9 per cent resulted in stillbirths (Table II).

Our figures compared favorably with those reported in current literature except for premature deaths in which our figures were greater. An analysis of the weights of the infants included under "prematures," however, showed that forty-two (29 per cent) weighed less than 1000 gm. An additional sixteen (11 per cent) weighed between 1000 and 1249 gm., while nineteen more (13 per cent) fell into the 1250-1499 gm. classification. In fairness to all concerned, it seemed permissible to exclude these seventy-seven babies weighing less than 1500 gm. from the mortality

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TABLE III. MORTALITY AMONG PREMATURE INFANTS

Birth Weight	Deaths	% of 141
Under 1000 gm.	42	29
1000-1249 gm.	16	11
1250-1499 gm.	19	13
1500-1749 gm.	18	12
1750-1999 gm.	16	11
2000-2500 gm.	25	17

Gross mortality27.3%
Corrected mortality14.6%

TABLE IV. NEONATAL MORTALITY IN RELATION TO METHOD OF DELIVERY

	No.	St. Mary's	Chicago Lying-In ¹⁴	Chicago Lying-In ¹⁵
Nat. cephalic	40	.559%	1.1	1.2
Low forceps	14	1.001	1.3	1.1
Mid & Hi forceps	2		5.0	
Breech	10	3.33	7.1	4.6
Cesarean	3	1.7	4.1	7.6
Version & Extraction	0	0	13.4	2.9
Inadequate Records	11	.128		14.5

percentage, since a high mortality is usually expected in this group. Hence, on a basis of the remaining sixty-four deaths, our corrected prematurity mortality was found to be 14.57 per cent (Table III). Since only full-term births were considered in this study, there was no further attempt to evaluate the care of these premature.

In order to further evaluate the causes of death in full-term infants, a further subdivision was made on a basis of type of deliveries and compared with the Chicago Lying-In Hospital (Table IV).

There was a total of seven, 151 cephalic full-term babies born since 1937 until December, 1945; 1,507 by instrument delivery; 300 by breech; 24 by version; 176 by cesarean section.

Our figures compared favorably in all types with the Chicago Lying-In Hospital. Deaths of cephalic presentations were .559 per cent with forceps next with 1.001 per cent. The percentage of deliveries with low, mid, and high forceps individually was not determined.

The highest death rate was in breech deliveries, 3.33 per cent. This was also evident in other

TABLE V. PERCENTAGE OF EACH PATHOLOGICAL FINDING IN FULL-TERM BIRTHS

	St. Mary's	Chicago Lying-In ¹⁴
Malformations causing death	31.25%	24.2%
Intracranial hemorrhage	23.75	23.4
Anoxemia (Including petechiae, atelectasis, asphyxia)	12.5	12.2
Edema of the brain	7.5	1.7
No pathological lesion found	6.25	5.0
Inadequate records or not autopsied	18.75	...

hospital reports. Cesarean sections accounted for 1.7 per cent, and there were no deaths with the version and extraction method. Records were inadequate in 11 cases or in 14.6 per cent of all our deaths. Since only 80 deaths occurred in our study, it is indeed regrettable that these records were not complete.

It was interesting to note the percentage totals grouped as to the pathological findings in those cases coming to autopsy as shown in Table V. Malformations headed the list with 31.25 per cent. Intracranial hemorrhage was next with 23.75 per cent. Anoxemia which included those babies showing at autopsy petechial hemorrhage, atelectasis, and asphyxia, was 12.50 per cent. No pathological lesions were found in 6.25 per cent of the cases. Records were inadequate in 18.75 per cent. Our statistics practically coincide with those of the Chicago Lying-In Hospital. Anoxemia and intracranial hemorrhage are still the main problems to combat in preventing neonatal deaths according to these figures.

It was discovered that the greatest percentage of deaths from anoxemia occurred in breech deliveries, 1.33 per cent, and the highest single percentage of intracranial hemorrhage was also in breech deliveries, 1.33 per cent (Table VI). Cephalic presentation had the lowest incidence of either anoxemia or intracranial hemorrhage. The number of cesarean section cases was numerically insufficient. It was not possible for statistical consideration to compare our figures with the Chicago Lying-In Hospital since theirs included premature deliveries whereas ours are limited to full-term births.

Since Vitamin K has been used prophylactically to prevent hemorrhage in the newborn, an attempt was made to determine if there was any difference between the number of deaths due to

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TABLE VI. ANOXEMIA AND INTRACRANIAL MORTALITY

Type of Delivery	Total Cases	Anoxemia		Intracranial	
		Deaths	%	Deaths	%
Cephalic	7,151	17	0.23%	8	0.1118%
Forceps	1,507	4	.265		.729
Breech	300	4	1.33	11	3.67
Cesarean	176	1	.568	4	2.27
Versions	24	0	...	0	...

intracranial hemorrhage in mothers receiving Vitamin K and those not receiving Vitamin K (Table VII). It would seem by our statistics that Vitamin K gave marked protection against intracranial hemorrhage. Beck et al.¹ by their figures show a similar ratio of protection.

We were interested in determining whether pituitrin given during labor would have any effect on fetal mortalities. Eighteen mothers received pituitrin in which there were full-term fetal deaths. Five cases were malformations, making a total of thirteen cases which died of asphyxia, intracranial hemorrhage, or unknown cause. Sixty-seven cases or 24.07 per cent of all full-term deaths showing intracranial hemorrhage, asphyxia, or dying of unknown cause received pituitrin. Since we did not investigate the cases in which the mothers received pituitrin and their babies did not die, we had no control by which to evaluate statistically the dangers of pituitrin to the newborn. Two causes of death in our series with the highest percentage were intracranial hemorrhage and anoxemia in which asphyxia seemed to be the primary factor.

Intracranial Hemorrhage

Intracranial hemorrhage is the second highest cause of fetal mortality in the literature and first highest cause in our analysis. The causes of intracranial hemorrhage are multiple. One of the most often considered is forceps deliveries. Any type of operative procedure, with the exception of the cesarean section, has a high incidence of intracranial hemorrhage.

Mechanism.—The mechanism of intracranial hemorrhage is well described by McGuiness. He states that forces acting on the head are in an anterior-posterior-lateral direction. These are compensated for by a vertical diameter lability, i.e., by sutures overlapping. This causes cerebral spinal fluid to be pressed out and the medulla

TABLE VII. VITAMIN K IN RELATION TO INTRACRANIAL HEMORRHAGE

	Vitamin K			No Vitamin K		
	No.	Deaths	%	No.	Deaths	%
St. Mary's,	19	2	10.5%	61	19	31.1%
Beck et al.	985		0.3	981		1.6

oblongata to be pushed into the foramen magnum. The falx and tentorium are the main resisting forces and the greatest stress is applied on a rectangular area at the junction of free margin of these two structures.

Technique in Mechanical Delivery.—If forceps are applied with blades well down on the mandible and the pull on the forceps is made augmenting uterine contractions, then they act as protection for the fetal skull. However, forceps applied in breech delivery on the after-coming head invite cerebral trauma since pressure is exerted on the biparietal diameter which is the most vulnerable.⁹ Also, a quick second stage may cause damage due to the sudden molding of the head.

McPhail and Hall also feel that unless the second stage is unduly prolonged, the practice of purely conservative obstetrics produces fewer apneic babies.¹⁰

Artificial Rupture of Membranes.—Bundeson, et al., in their study of 3,725 deaths, concluded that "dry labor" seemed to be associated with intracranial hemorrhage more often than in association with other neonatal deaths; therefore, artificial rupture of the membranes should only be done when indicated.⁸ This is confirmed by other reports in the literature.

Deliberate Delivery Prevention.—It is the custom in many obstetric wards in private hospitals to delay delivery by preventing the head from delivering by either pressure against the head with the hand or by closely approximating the legs on the delivery table. The patient may or may not be anesthetized. This practice is not to be condoned. Such practice may well promote intracranial hemorrhage; or cause enough edema of the brain to decrease its blood supply. Clifford states that the practice of prolonging the second stage of labor by pressure on the perineum accompanied by general anesthesia should be discouraged as it also may produce serious asphyxia.⁴

While it is understandable that the convenience of the obstetrician comes into the picture, head nurses should not be expected to have the expectant mother deliver at just the opportune moment.

Pituitrin.—Bundesen, et al., in a study of 3,725 deaths, discovered that pituitrin was given twice as frequently to mothers of infants which died under two weeks of age as compared to those infants which died from one to eleven months and whose mothers had received pituitrin. He states that there is a twofold danger with the use of pituitrin: (1) rupture of the uterus, (2) violent labor. Violent labor is very conducive to intracranial hemorrhage, thereby causing asphyxia.

A multitude of evidence is found in the literature about the danger of pituitrin. For obstetrical usage pituitrin is a dangerous drug and needs the closest supervision by the obstetrician. If given, an anesthetic should always be on hand to anesthetize the patient should her uterine contractions become too severe or, as is sometimes the case, should she get tetanic contractions of the uterus.

Vitamin K.—Since our statistics seemed to show some protection with the use of Vitamin K, it was interesting to note the varied reports in the literature.

Extensive research has proved without doubt that in newborns Vitamin K prolongs the prothrombin time. During the first, second, and third day of life, prothrombin levels decrease and steadily increase the fourth, fifth, and sixth day until they return almost to "cord normal" by the seventh day.¹⁵ This has also been confirmed by statistics by E. Potter¹² and A. C. Beck, et al.¹ Sanford, et al.¹⁵ and Fitzgerald and Webster state that in spite of low prothrombin time the blood of newborns coagulates faster than in adults and that there are other known substances that cause cord blood to coagulate.¹⁵

Hellman, Shettler, and Eastman state that prothrombin levels in newborn infants are from 14-39 per cent of normal. Several days after delivery, many infants die of intracranial hemorrhage. In Craig's study of 126 neonatal deaths intracranial hemorrhage occurred mainly between the second and sixth day. This is most important especially in cases of oozing. In a series of 776 cases studied in which one half were given Vitamin K and the other half were not given Vita-

min K with the group as equal as possible, there were almost three times as many deaths in this group not receiving Vitamin K with two times as many cases of retinal hemorrhages.⁶ When used, Vitamin K should be given every five hours of labor and at least five hours before delivery if it is to be of material benefit.

Contrariwise, Sanford, et al., states that in a series of 1,693 newborn babies, 711 of which received Vitamin K, there was no reduction in incidence of hemorrhage.¹⁵ This was also brought out by statistical analysis of 13,290 cases of newborns over a four-year period of study by E. Potter in which there was no decrease in infant mortality in those cases receiving Vitamin K.¹²

Infants dying of cerebral hemorrhage had low Vitamin C according to Fleming and Sanford. Vitamin C is transferred from mother to child by foods or medicines.⁵

Anoxemia

Those cases showing at autopsy examination evidence of petechial hemorrhage, atelectasis, and asphyxia were included in the classification of anoxemia. Since asphyxia contributes toward atelectasis and petechial hemorrhage, investigation of the factors leading to asphyxia was indicated.

Experimental Physiology.—It is important to interpret physiologically this respiration of the fetus *in utero* in order to better determine the causes of asphyxia. Eastman states that respiration is biologically established in intrauterine life as is cardiac, renal, and hepatic cellular activity. Therefore the initiation of respiration in newborns tends to establish what is already a permanent and vital function.⁸

Experiments by Snyder in which he injected India ink into the amniotic fluid in cord sectioned full-term rabbits showed that, due to intrauterine rhythmic respiratory movements of the fetus, a tidal flow was maintained of amniotic fluid between the pulmonary alveoli and the amniotic sac contents. India ink was found in the alveoli of rabbits and the amount of ink was in direct proportion to the rate of fetal respiration.¹⁷

During postmortem examination masses of cellular, fibrillar and amorphous debris are found in alveoli and terminal bronchioles. This is confirmed by Paterson and Farr.¹¹ If any bacteria are present in the amniotic fluid, it could well explain fetal intrauterine pneumonia.¹⁸ This debris

is present in stillborns, probably because of agonal respiration of the fetus. If the newborn's first breath is a healthy gasp, it tends to dislodge obstructive debris. However, if respiration is weak, the debris decreases respiration which in turn prevents it from being dislodged and so a vicious circle is set up.¹¹ Thus, an initial strong gasp snaps the alveoli open and is beneficial to the child¹⁰; also, since the alveoli are filled with amniotic fluid and are partially dilated, it is necessary for the child to breathe in order to increase the size of the alveoli and thereby prevent it from drowning.¹⁸ After birth, aspiration of the pharynx and nostrils and the Trendelenberg position facilitates a removal of this fluid.

However, once air is in the alveoli, the patency therein must be maintained. Coryllas and Birnbaum state that trapped air may be entirely absorbed. Peskin and Fineman have proved that if the vessels to the lung in which air is trapped in the alveoli are occluded, air will not be absorbed. Since pure gases are removed quickly from the alveoli, it aids to have the child breathe C_2 , CO_2 , and atmospheric air to prevent too sudden absorption of gases in the alveoli serviced by partially occluded bronchi.¹¹

Causes of Asphyxia.—Marchetti divided asphyxia neonatorum into two groups according to origin, intra-uterine and extra-uterine. Intra-uterine factors are subdivided into maternal and fetal factors. Maternal factors are placental circulation, administration of drugs to the mother during labor, protracted labor, prolonged second stages, hemorrhage, convulsions, and death of the mother. Fetal factors are pressure upon the head, pressure on the cord, winding of the cord around the baby's neck. Extra-uterine factors are usually anesthetics, analgesia, primary disease, malformation of vital organs⁹, sudden release or compression of the head passing through the birth canal.

Anesthetics.—Pressure from the laity has forced the medical profession to increase the use of analgesic and anesthesia.

An analysis of anesthetics was not attempted due to the incompleteness of our records. Literature records the results of much investigation upon the subject of anesthesia and its effect on newborns. During labor, since the fetus is in a relative state of anoxia and apnea, any medications that cause a decrease of respiration or O_2 intake

on the part of the mother will also have an effect on the child.

Eastman states that mixtures of 15 to 85 per cent of oxygen and nitrous oxide, respectively, for periods of five minutes cause various degrees of anoxemia fetalis, but the newborn is not harmed. However, oxygen and nitrous oxide 10 to 90 per cent, respectively, for a length of time greater than five minutes causes a marked degree of fetal anoxia in about one baby out of three.

Smith states that cyclopropane dilates the capillary beds and the blood circulates so fast through the capillary bed of the placenta that the fetus fails to get an adequate supply of oxygen. They were able to drop the mortality from cesarean section in full-term pregnancies from 54.2 to 16 per cent when no premedication was given to the mother and when the baby was delivered four minutes from the beginning of anesthesia.⁴

McPhail and Hall found that any trauma or increased pressure on the baby's head prevents free circulation of the cerebral circulatory system and as a result less oxygen is carried to the brain and may produce anoxia with resulting degenerative changes in the cerebral cells and is probably the most frequent cause of neonatal anoxia. A baby born of a mother showing signs of anoxia would be very likely to be apneic at birth, and the study proved that a high incidence of severe apnea was noted in babies born of mothers who became excited. They hypothesize that excitement as a state of anoxia.¹⁰

Eastman states that asphyxia neonatorum is an example of profound oxygen want; and for this reason, McPhail and Hall give oxygen freely to the mother during the second stage of labor and as long as the cord pulsates.⁴

Henderson, Foster, and Eno state that in a series of 975 consecutive deliveries in which both local anesthetic (infiltration) and general anesthetics were used the use of local anesthetic whenever possible will reduce the natural hazard of birth. General anesthesia definitely decreases the respiratory response of the newborn.⁷

Analgesics.—Analgesics were not considered in our report since demerol is now currently used but has been used such a short time that no statistical evaluation was possible. No reports have yet appeared about the results of the use of demerol in relation to asphyxia of newborns. Of the currently useful analgesics, demerol seems to have the least effect on the respiration of the

fetus. However, reports are present in the literature of respiratory depression of adults with the use of demerol. Clinically, analgesia does not decrease the oxygen content to the mother or fetus. However, if respiratory depression from drugs exists, then asphyxia will develop as placental circulation decreases.

Wilson states that most drugs administered to the mother pass to the child and desensitize the respiratory centers of both the mother and fetus. Irving and his associates show that of all children born of undrugged mothers, less than 2 per cent fail to breathe spontaneously; however, drugs which are frequently used have such a strong depressing action on the children that 35-68 per cent fail to breathe immediately upon birth.²⁰ Thus it is clear that despite hesitance on the part of attending physicians to admit that some surcease maternal medications challenge the right of the child to live, yet the figures speak for themselves.

Cerebral Effects of Asphyxia.—It is a well-recognized fact that severe asphyxia may lead to a residual effect on brain tissues. Clifford, in his studies, describes the stages of brain damage:

Stage I—Interference with placental circulation increases blood vessel congestion of the fetus.

Stage II—This, in turn, causes liberation of edema fluid into tissue spaces and body cavities.

Stage III—There then occurs liberation of a number of red blood cells either through diapedesis or actual rupture of small blood vessels resulting in:

1. Petechiae
2. Alveolar hemorrhage
3. Microscopic to large amounts of red blood cells in the cerebrospinal fluid.

Stage IV—Actual necrosis then takes place showing changes from areas of ganglion cell degeneration to widespread encephalomalacia.

These sequences complicate resuscitation, alter the respiratory rate and rhythm, induce muscular atonicity, and induce convulsive movements.

In addition to the brain, when edema collects in the lungs, it renders them incapable of normal expansion and results in atelectasis with clinical manifestations.⁴

W. F. Windle, in an excellent study of guinea pigs which have been subjected to various degrees of asphyxia, has proved by maze tests and microscopic examination of their brains that there is a definite correlation between asphyxia and brain damage. He states, "The possibility of inferior mentality, diminished learning ability, or mental

dullness as sequelae of anoxia at birth should not be dismissed lightly."²¹

Treatment of Asphyxia.—Since some degree of asphyxia is present regardless of the care in the handling of obstetric cases, the immediate emergency care of newborns is of paramount importance. Methods in common use here at the hospital are: aspiration of mucus with bulb syringe, hot and cold baths, ether applied to skin of infant, mouth-to-mouth breathing, coramine and lobulin (intramuscular and intravenous), and, only in too rare occasions, intratracheal insufflation. Varying results are obtained by these measures, and, with the exception of stimulants and intratracheal insufflation, the results in severe asphyxias, particularly asphyxia pallida, are discouraging.

Marchetti states that the so-called tubbing of the baby is more injurious than helpful.⁸ A newborn in a state of asphyxia is already in a state of shock and plunging him into a tub of cold water only increases his state of shock. Slapping and rough treatment of the child are definitely to be condemned.⁸ This is the general consensus of opinion of staffs of teaching centers and larger hospitals.

Wilson, Torrey, and Johnson in an analysis of 16,000 live births, in which there were 381 cases of asphyxia, including severe asphyxia pallida, studied the effect of all common methods of resuscitation and intravenous stimulants. Their experiments were well controlled and well recorded.

Their opinion in regard to artificial respiration applied to the chest by manual means is that it obviously does no good to further compress a solid fetal lung; and, if any air is present in the bronchial tree, it will be expelled restoring the original atelectasis. Since the respiratory center must be stimulated, and peripheral stimuli can in no way reach the center, the stimuli must needs be chemical in nature.

Mouth to mouth insufflation stands condemned because of the danger of infection to the child. Also, air usually enters the esophagus instead of the trachea. This has been confirmed by other investigators. Also, in experiments on newborns that died during delivery, autopsies proved that when pressure from 4 to 18 mm. of water were used to aerate the lungs, no air had entered the alveoli and, if present, there were usually blisters beneath the pleura and torn pulmonary tissue. Damage can occur with the use of only "cheek

muscles." When carried out, a graduated manometer should be used.

The conclusion was that while the bronchial tree can be extended, chest walls expanded, and the diaphragm displaced, the lung tissue itself cannot be aerated adequately even by pressure sufficient to cause injury or destruction. This has been confirmed by Murphy and Bower in 1933 in a series of children examined postmortem in which pressure of 8 to 10 cm. of water were used.²⁰

However, these conclusions, while no doubt true for cases of atelectasis, may not hold for mild asphyxia—newborns who fail to breathe but do not have atelectic lungs. Since, as was before mentioned, newborn infants have alveoli containing amniotic fluid and are, therefore, partially distended, it is hard to realize why air could not be easily forced into these expanded alveoli.

Wilson, et al., further state that resuscitators are of no value in severe cases and are contraindicated if they employ suction. Inhalators are of value only in the case of the poorly breathing baby. Eastman states that the respiratory center becomes insensitized in the last few months of uterine life to increasing CO_2 tension. Since O_2 sensitizes the center and CO_2 stimulates it, O_2 should be administered to the newborn, especially in asphyxia. A different view is taken by Henderson who states that increased CO_2 is necessary because of decreased sensitivity of the respiratory center to CO_2 tension.

The inhalator is the best and safest method of saving the life of the asphyxiated but breathing baby. Also, it is of value in preventing atelectasis and pneumonia.

Intubation and Insufflation.—Wilson, et al., have concluded that alveoli cannot be distended by direct full expansion of lungs by forceful injection of gases into the trachea. They feel intubation is of assistance for the following reasons:

1. Complete aspiration of mucus and debris from bronchi and tracheae.
2. Bronchial tree, larynx, and pharynx can be distended and chest increased in size making, therefore, absorption of oxygen more rapid. Babies have been kept alive for two hours by this method although at autopsy there were no expanded alveoli. It seems then that the absorption of gases was by the mucosa of the bronchi and tracheae.
3. Increased dilatation of bronchi brings into

play the Hering Breuer reflex. This reflex may be absent in some cases but will return as circulation improves which may come about by absorption of O_2 by mucosal lining of trachea and bronchi.

Therefore, intratracheal intubation should be done on all severely asphyxiated newborn babies.²⁰

Intubation can be done by means of the Flag laryngoscope or by guidance of the tube into the trachea with the little finger. This was carried out here at St. Mary's Hospital in several cases in which the newborn progressed from a state of asphyxia livida to asphyxia pallida and was revived only by using intratracheal intubation.

There is evidence pointing to the fact that bronchoscopy can be carried out in newborns and even in prematures without ill effects.²²

Intravenous Resuscitation.—Extensive study was done by Wilson et al., with all types of intravenous stimulants. Lobeline hydrochloride was found to be most effective and safest. They proved by their experiments that alpha-lobeline will:

1. Heighten the respiratory efficiency of a normally breathing baby.
2. Rapidly overcome respiratory depression due to morphine.
3. Produce such a marked expansion of the thoracic cavity as to greatly reduce if not entirely remove atelectasis.
4. Actually initiate respiration in serious asphyxias.

However, to get the best result, a definite method should be followed and will be given subsequently. Lobeline decreases the threshold of the respiratory center to carbon dioxide. Overdosage will result in temporary apnea and fixation of the chest and diaphragm in the inspiratory position.²⁰

In a review of the literature, Biggs was of the impression that intracardiac stimulants of epinephrine are most favored.²

Technique of Resuscitation

1. As soon as head is delivered, wipe the mucus and fluid from infant's nose and mouth. Aspirate at that time with soft rubber bulb syringe.
2. Deliver the rest of the child and if the child is in mild asphyxia and is breathing, place it in an incubator or warm blankets in about 30 degree Trendelenburg position; and Wilson, et al., include also the use of a mask with O_2 and CO_2 .
3. If the child is not breathing and the asphyxia is

very severe, insert a soft rubber catheter into the trachea and aspirate the debris and fluid. Attach $\text{CO}_2:\text{O}_2$ under 10 to 12 mm. of water pressure with outlet valve attached through which the child exhales.

4. From 1/20 to 3/20 gr. alpha-lobeline may be injected into the umbilical vein about 7 to 8 cm. from baby's body. Then a clamp is applied distally to the injection. Slowly "milk" the lobeline into the child's body until a gasp occurs, then clamp the umbilical cord at the usual distance from the child's body. If there is no effect of lobeline when the entire amount is stripped into the body, it can be taken for granted there will be no results with lobeline. Other stimulants can be tried such as epinephrine which is considered excellent.²⁰

5. In the most extreme cases, epinephrine injected into the heart is beneficial in a few instances.^{19,20}

Above all, the child should be kept warm and the mucus removed.

Summary

1. This survey objectifies the need of more complete obstetrical records. Careful charting of the time required for the various stages of labor; the relationship of the degrees of maternal pain and the response to the chosen analgesics and anesthetics or plane of anesthesia required—all would expedite recurring analyses of this type and permit salutary deductions as to delivery methods.

2. Our statistics compare favorably with those of the Chicago Lying-In Hospital.

3. Intracranial hemorrhage and anoxemia remain our greatest problem in neonatal death.

4. Low forceps applications are associated with a slightly increased percentage of deaths over natural spontaneous delivery.

5. Instrument delivery, artificial rupture of membranes, pituitrin, and mechanical delaying of spontaneous delivery all contribute to intracranial hemorrhage.

6. Vitamin K is inexpensive and harmless and should be used routinely since it increases prothrombin time.

7. Local infiltration anesthesia promotes the lowest fetal mortality. However, nitrous oxide and oxygen given only with the pains is a safe anesthesia.

8. All analgesics may be considered as possible factors in neonatal deaths.

9. In severe cases of asphyxia, the following three methods will give the best results:

- (1) Intratracheal intubation and insufflation.
- (2) Administration of $\text{CO}_2:\text{O}_2$ through an intratracheal tube at 10 to 12 mm. of water pressure.
- (3) Intravenous administration of 1/20 to 3/20 gr. lobeline hydrochloride.

10. Intratracheal intubation deserves more extensive trial and usage.

11. A simple inhalator should be available for infants with mild asphyxia having shallow breathing.

The author wishes to express his thanks to Drs. R. J. Moe and E. L. Touhy for constructive criticisms and to Sister M. Loretta and the record library staff for aiding in compiling the data for statistical review.

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CLINICAL-PATHOLOGICAL CONFERENCE

SUBACUTE BACTERIAL ENDOCARDITIS WITH RUPTURE OF SPLEEN

A. J. HERTZOG, M.D., G. NESSE, M.D., and CHARLES VANDERSLUIS, M.D.

Minneapolis, Minnesota

DR. RALPH ANDERSON: This case, A-46-758, is that of a seventy-two-year-old man who was admitted to the Minneapolis General Hospital on April 17, 1946, complaining of an inability to talk. He had been eating his meals in a restaurant and lately had been unable to order any food. This speech defect had been gradually getting worse during the past three months. Physical examination on admission revealed a well developed and well nourished white male. His pupils reacted to light and accommodation. The left pupil was larger than the right. There were extensive dental caries. He was unable to write or speak plainly. Blood pressure was 140/70. Temperature was 100 degrees. His heart tones were normal. The lungs revealed nothing of note. Abdominal examination revealed no masses or tenderness. His cranial nerves were normal. His deep reflexes were normal but the cremasteric reflexes were hypo-active. The Babinski test was negative. His co-ordination was normal. Sensory examination revealed nothing of note. Blood serology was negative. An x-ray of his chest revealed no signs of pulmonary pathology. Hemoglobin was 55 per cent (Sahli); red blood count was 3,000,000; leukocyte count was 5,800 with 61 per cent neutrophils. A urinalysis showed a specific gravity of 1.024, a trace of albumin, negative sugar, numerous red blood cells, a few leukocytes, and an occasional hyaline and granular cast. The clinical diagnosis was motor aphasia due to a cerebrovascular accident.

The patient's condition showed little change. He ran an irregular fever that varied from 102 to 99 degrees. Another urinalysis on April 23 revealed a negative sediment. On April 26, he complained of abdominal pain. He was found on the floor by the side of his bed. When put back to bed, he was very restless and tossed about. His color was ashen and his pulse was imperceptible. He expired soon afterwards on April 26, 1946.

PHYSICIAN: Was the neurologist able to locate the position of the cerebral lesion responsible for the speech difficulty?

DR. RALPH ANDERSON: Yes, the lesion was thought to be in the vicinity of Broca's area in the left cerebral hemisphere and either an infarct or hemorrhage.

DR. HERTZOG: This case is not as simple as it seems. You must remember that he had anemia, fever and hematuria. There was also considerable abdominal pain just prior to death.

From the Minneapolis General Hospital, A. J. Hertzog, Pathologist.

DR. ALBERT CANFIELD: This case would not be presented at this conference if it were only a cerebral hemorrhage or infarct. The anemia, fever, and hematuria suggest a bacterial endocarditis. Was a blood culture taken?

DR. HERTZOG: A blood culture was not taken. One has to keep in mind that it is not unusual to have symptoms referable to an infarct in either the brain, kidney, or spleen as the first sign of bacterial endocarditis. Dr. Vandersluis will give the autopsy findings.

Autopsy

DR. CHARLES VANDERSLUIS: The body of this seventy-two-year-old male was wasted and thin. The abdomen contained approximately 2,000 c.c. of liquid and clotted blood. The source of the hemoperitoneum was a large oblique tear on the surface of the spleen. The spleen contained old and recent infarcts. A large hemorrhagic infarct had ruptured and given rise to the fatal intra-abdominal hemorrhage. At the time of the autopsy the possibility of the hemorrhage arising from a ruptured angioma of the spleen was considered as a possibility as the whole organ was soft and bloody. However, microscopic sections exclude an angioma and confirm the diagnosis of infarction.

The heart weighed 330 grams. The mitral valve showed thickening and rigidity of the leaflets as one sees in an old rheumatic valvulitis that has not produced sufficient deformity to result in functional impairment of the heart. There was a large fresh vegetation attached to the auricular surface of the mitral valve as one sees in bacterial endocarditis. The brain showed an oval depression measuring 3 x 3.5 x 1.5 cm. along the supramarginal gyrus in the left parietal lobe above the Sylvian fissure. Microscopically this proved to be an infarct that we have reason to believe was on the same basis as those in the spleen; namely, emboli from the large vegetations of the mitral valve. The only other significant findings were the kidneys. They showed an embolic type of glomerulonephritis as frequently seen with bacterial endocarditis.

DR. HERTZOG: As far as I know this is the second case of a ruptured spleen associated with bacterial endocarditis that has occurred in this hospital. Dr. Nesse will give a short review of the literature on non-traumatic ruptures of the spleen.

DR. GERHARD NESSE: Rupture of the spleen is a comparatively rare occurrence. In Harlem Hospital in New

York City the incidence of traumatic rupture of the normal spleen was one case in every 666 accident admissions.¹⁰ Spontaneous rupture must be far less common. Spontaneous rupture occurs almost invariably only in pathological spleens, although cases have been reported in which an apparently normal spleen ruptured without trauma.^{6,7} Some authors like Roettig¹³ and Best² doubt whether normal spleens ever rupture spontaneously. Typhoid fever, malaria, acute infectious mononucleosis, leukemia, splenic neoplasms, and even torsion of the pedicle may cause spontaneous rupture.

Thirty-two cases of splenic rupture during the treatment of neurosyphilis have been reported⁸; of these, recovery following splenectomy occurred in only one case.¹⁵ It has been suggested that rupture occurs more readily in luetics because the splenic capsule loses its elasticity and becomes adherent to the diaphragm, hence the distension associated with malaria causes it to tear.⁸

It is well known that the spleen very seldom ruptures spontaneously in naturally acquired malaria, although it is susceptible to tearing by slight or moderate trauma. Russ and Gaynor reported the case of a soldier who had malaria while stationed in India, and suffered a splenic rupture when the malaria recurred while he was home on furlough.¹⁴ This case survived following treatment by splenectomy.

McCarthy and Knoepf have reported two instances of spontaneous rupture in which recovery followed splenectomy.¹¹ These cases also were in soldiers. In one it was due to acute infectious mononucleosis, and in the other to an hemangioma of the spleen. It seems that most of the recoveries are in military cases; perhaps this is due to the more vigorous physical condition of the soldier patients.

Cases where this catastrophe is a complication of bacterial endocarditis, as our case today was, are exceedingly rare. Kerkhof and Giere reported such a case in 1933⁹ from this hospital. In that case there was no hemorrhage into the peritoneal cavity, but a septic infarct of the spleen ruptured into the abdominal cavity giving rise to a fatal peritonitis due to streptococcus viridans. At the time of their report, Kerkhof and Giere were able to find only one other report of ruptured splenic infarct in subacute bacterial endocarditis.¹⁰ Recently another case very similar to ours was reported in the case records of the Massachusetts General Hospital.⁴

It is sometimes hard to distinguish between traumatic and spontaneous rupture of the spleen, for bending over, a minor fall, coughing, a malarial paroxysm, a playful blow on the abdomen, or tossing and turning in bed may be enough to cause tearing of the capsule of a distended, soft, and friable organ. Pain is experienced in the left upper quadrant, and there may be pain in the left shoulder. Pronounced weakness and perhaps fainting accompanies an active hemorrhage. The blood pressure is usually low when the patient is first examined, and successive readings reveal a downward trend of the blood pressure. There is usually rigidity, tenderness, and rebound tenderness of the left upper quadrant. The white blood count becomes elevated quite soon. Hemoglobin values and red blood counts go down if the bleed-

ing continues and determinations are made over a period of many hours.

If a peritoneal tap is made with a needle, blood may be drawn back, which confirms the diagnosis of intraperitoneal hemorrhage. But failure to encounter blood does not rule out the presence of hemorrhage, for the blood may be walled off by loops of bowel or folds of omentum.

Ballance's sign may be present.¹ It consists in an enlargement of the area of percussible splenic dullness. A flat x-ray plate of the abdomen may reveal an area of increased density in the left upper quadrant, surrounding the spleen, or the shadow of the spleen may be indistinct and the stomach dilated with serration of the greater curvature.¹²

Rupture of the spleen is an urgent surgical emergency. Liberal transfusions with blood and plasma must be given if the patient is in shock, and blood must be available even if the patient's condition appears good. The blood pressure should be raised to normal or near normal levels before operation, if that can be done without losing too much time. In some cases, however, the only thing which can stay the downward trend in the blood pressure is to open the abdomen as expeditiously as possible and clamp off the splenic pedicle.

It should be remembered that all cases of splenic rupture do not occur immediately after trauma. In one out of seven cases the syndrome of delayed splenic rupture occurs.¹⁷ Here the pulp is torn and an encapsulated hemorrhage is formed under the capsule. Several days or even weeks later the capsule may give way, perhaps due to pressure necrosis and a severe secondary hemorrhage occurs.⁵

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◆ HISTORY OF MEDICINE IN MINNESOTA ◆

NOTES ON THE HISTORY OF MEDICINE IN FILLMORE COUNTY PRIOR TO 1900

By NORA H. GUTHREY

Mayo Clinic
Rochester, Minnesota

(Continued from July Issue)

Under the General Statutes of 1866 of Minnesota the township supervisors, among whom was an occasional physician, for six years comprised the local boards of health. When, in 1866, Dr. Charles N. Hewitt, of Red Wing, whose hobby during his service in the Civil War had been sanitation of army camps, brought to civilian life in Minnesota the conviction that the prevention of disease by physicians should be as important as the cure, he began the one-man campaign that resulted, in 1872, in the creation of a state board of health with comprehensive but merely advisory powers, extending into counties and townships. The next year the powers of the board were strengthened by requiring each township to elect a town board of health of not less than three members, one of whom was to be a physician. In 1873 specific response was made in Fillmore County to this special law, a physician serving in every township and in nearly every village, and by 1880 the local rules were increasingly stringent, as to the state of cellars, out-building, stables, cowyards and sties; the boards of health asserted their right of entry for inspection and the right to issue orders for cleaning up by a set time (usually an annual event and in May); the fine for violation was from \$3.00 to \$20.00 and lock-up or Fillmore County jail until the fine was paid. And when, after provision for recording of vital statistics had been made, announcements appeared that town clerks would enforce the registration of births and deaths; the penalty for failure to file was \$20.00.

It was in the early period of attempted education of the public that one hard-working health officer in southern Minnesota lamented "the pure innate hellishness" of a certain class of people, found everywhere but particularly in small towns, he said, a class who could not conceive of a medical man being interested in the well-being of his neighbors to the detriment of his own pocket. After ten years of gradual improvement, "the state of the public mind," wrote Folwell, "seemed to warrant the use of public authority in curbing contagious disease and maintaining public health." The teeth of the new act of 1883 were in the section that made violations of the law and of the regulations of the state or local board of health misdemeanors punishable by fine or imprisonment or both. It was in this early period also in Minnesota that the county physician in accepting office engaged for a nominal salary of considerably less than a dollar a day to travel over the entire county to those needy patients who might require his services, to administer to the sick and to furnish medicine.

By and through the nineties, reports of village boards of health were evidence of close attention to matters of public health, notably in the schools in guarding

against spread of communicable diseases. There were frequent statements that pupils had been sent home and that certain rooms or whole schools had been closed for specified periods.

Smallpox in Fillmore County.—As noted previously, there were in the county in the first decade after its organization scattered cases of smallpox, in some of which death occurred. Thus early, and long thereafter, the better physicians advocated vaccination against the disease and through the public press announced themselves, as has been noted, as possessors of reliable vaccine virus for prevention, available to all who wished for protection. But even in 1873, when smallpox was a recognized and serious menace in all parts of the county and when the State Board of Health had been established and had manifested its attitude toward the prevention of disease the effect of these notices of the physicians was reduced by well-meant but uninformed editorial additions (although at times in the same papers the value of vaccination had been stressed by the publishers) in which the public was assured that cleanliness and wholesome food were efficient preventives of the spread of the epidemic.

It was not until the epidemic of 1882 that statements concerning smallpox in Fillmore County appeared in the annual reports of the State Board of Health, and then came a detailed story of two cases of the disease in Lanesboro from Dr. J. C. Hvorslef, the local health officer. A family of emigrants from Norway had come on an infected ship fourteen days from Liverpool, reaching Philadelphia on March 29, and they had arrived in Lanesboro on April 1. The twelfth day after leaving the ship two of the group came down with confluent smallpox. Dr. Hvorslef quarantined the house, used disinfectants constantly, was the only person seeing the sick, and after each visit he changed his clothing and washed and disinfected himself. Because it was impossible to find any attendant for the patients or help for the quarantined family, Dr. Hvorslef himself carried food, water and medicine to them all during the entire period of quarantine; his task was made no easier by constant complaints from the townspeople that the sick should be removed to a less thickly settled part of the village. One point of difference only rose between the state board and the local health officer. When instructed to vaccinate immediately all members of the affected family, Dr. Hvorslef instead followed the advice of his collegiate teacher of medicine, Professor Niemeyer, who had taught that persons already infected with smallpox should not be vaccinated. The secretary (Hewitt) of the state board replied to Dr. Hvorslef's report of the course he had followed. "Am sorry to take issue with Niemeyer, but repeatedly during the last six months we have vaccinated families such as your cases were in, and the vaccine has either prevented the variola altogether, or converted it into varioloid. I am utterly at a loss to know how you are to judge that this or that person is, at any given time, 'infected.' But vaccination enables you to *know* whether they are protected which is our problem in such cases." By May 25 the family was discharged from quarantine; there was no further outbreak of smallpox in the community.

In subsequent years, prior to 1900, although no doubt there were occasional cases of smallpox in Fillmore County, further accounts did not appear in the records of the State Board of Health.

Diphtheria in Fillmore County.—From the earliest years diphtheria appeared from time to time in the county and with increasing settlement of the region came increasing incidence of the disease. In the local newspapers in the late fifties and in the sixties appeared comments of which the following, in 1862,

is typical (this is the official *Fillmore County Republican*, of Preston): "The diphtheria: This somewhat new and dangerous throat disease has made quite a havoc among the children in the village. Some half a dozen have already fell (sic) victims to this almost fatal disease." In this period also appeared gratuitous advice, source unspecified, as to medical treatment for the disease: chiefly iodene diluted with whiskey, and one tablespoon of whiskey taken every hour. In 1864 there was an outbreak of virulent diphtheria in southwestern and western Fillmore County and, by extension, in eastern Mower County, and in the seventies, eighties and nineties came other sporadic outbreaks and even epidemics, which the local physicians labored to control. Greatest effort of all boards of health in the next decades was directed toward the prevention of diphtheria and other communicable diseases, and the accomplishment was difficult because of the survival of the ancient pious belief that illnesses were divine punishments for sin and warnings against misdemeanors. Even into the eighties it was impossible to convince the people, in Fillmore County and adjoining counties, as elsewhere, of the extreme contagiousness of diphtheria. One clergyman held public funerals of the victims of the disease which he exhorted all children and adult persons to attend; the coffins were opened wide that all might "contemplate the wisdom of their divine creator." All looked, many of whom within a few days were dead from diphtheria.

In the records of the State Board of Health the first accounts of diphtheria in Fillmore County appeared in annual reports of 1878 (published in 1879), succinct and informative statements dealing with various aspects of the disease, submitted by Dr. R. L. Moore of Spring Valley and Dr. T. H. Everts of Rushford, two of the thirty-five physicians in the state who had responded among the fifty-three who had been circularized.

Dr. Moore, on the west central edge of the county, first stated: "Sporadic cases of diphtheria are occurring at the present time. I think not a year passes in which we do not see some cases. One epidemic of 1877 was from January 10 to November 1: There were in the township twenty deaths from diphtheria in about 240 cases . . . It is a remarkable fact that not a Norwegian had diphtheria." His summary was: "In no disease is there greater need of courage and vigilance. Strike earnest, vigorous and rapid blows. Don't give a little dose of chlorate of potash or of sulpho-carbulate of soda every three hours and then when your patient dies between the second and third dose, ascribe it all to Providence and the malignancy of the disease. Remember you are in the face of a disease of moments rather than of hours and days. Give your patients your best remedies every half hour and for eighteen hours out of the twenty-four. Don't give any opium. Spray and gargle the throat, but don't use the swab nor forcibly detach the membrane. For gargling or spraying, pretty strong solutions of chloral hydrate stand at the head."

Dr. Everts, in the northeastern corner of the county, gave a detailed and thoughtful comment, from which a few lines appear here. Reporting for himself and his local confreres, as did Dr. Moore, he stated that in the autumn of 1862 there had been in the vicinity of Rushford a few malignant cases of diphtheria but that since observations of the disease by local physicians had been confined to a comparatively few cases, all but two of which had occurred in a single locale and severe epidemic in the winter of 1876 and 1877. Half of the patients, whose disease clearly was diagnosed as diphtheria, died; those who had "simple sore throat" recovered. Concurrently there had been many cases of scarlet fever. Dr. Everts continued: "The inference from observation is irresistible, that some general cause is operative in the production of sore throats with fever . . . Cases

presenting contagious membranous exudation (not merely apthous spots, however large) upon the mucous surface, and developing grave symptoms of systemic poisoning—which such cases always do—we diagnose diphtheria; other cases, not.” And, “fifty per cent of cases of true diphtheria have proved fatal. Blood poisoning has seemed to be the chief element in all, and in several a sole cause of death. The principal sequela observed has been the paralysis of the optic and glosso-pharyngeal nerve.” The disease had prevailed in a mild open winter; conditions of soil evidently were not concerned in its production. Cases occurred in the valley, on dry, sandy soil and on ridges elevated and perfectly drained, in homes of low social conditions and filthy surroundings and in the homes of the best class of residents, in surroundings in every way unexceptional.

From Chatfield, on the north central border of the county, over a period of years in the late seventies came many reports of cases, unsigned, but known to have been submitted by Drs. A. H. Trow, M. A. Trow, and R. W. Twitchell. In one report was propounded the theory that the damp decaying foundation timbers in a home in which diphtheria had struck were responsible. “Such a home in Memphis would help to propagate yellow fever; why not diphtheria in Minnesota?” And there were reported, concerning causes other than contagious, “decaying strawstacks near dwellings; wells into which surface drainage is allowed to run; old log houses and exceedingly filthy cellars.”

From Lenora, in southeastern Fillmore County, came reports of cases of malignant diphtheria in 1877 and in the following two years. Here the homes afflicted with the disease were on dry, high ground; the water was from wells and cisterns.

The physicians of Fillmore County who replied to circulars and furnished most of the data for the official report for the period from November 1, 1879, to November 1, 1880, inclusive, were R. L. Moore and A. F. Whitman, Spring Valley; H. C. Grover, Rushford; L. Redmon and T. E. Hall, Preston; A. H. Trow, M. A. Trow and R. W. Twitchell, Chatfield; A. Plummer, Hamilton; J. M. Wheat, Lenora, and D. J. Lathrop, Granger, the latter a village centrally placed at the southern border of the county.

Although Dr. J. W. Magelssen, of Rushford, was not one who gave an official report on diphtheria, he was engaged in the care of sufferers from the disease. His description, in his memoirs, of the epidemic of 1881 and 1882 is graphic and recalls the name “bladders in the throat,” that was given to diphtheria during the plagues of the seventh century. He speaks here for himself and for all his fellow physicians in that time of stress in Fillmore County:

In the winter of 1881 and 1882 the country was swept by a perfect scourge of diphtheria, of the most malignant type. It was like the plagues and pestilences of which one reads in the old days; like the black plague of London, described by DeFoe.

Often the people stricken in the morning were dead at night. Their throats were literally rotten; the stench was so awful that it was noticeable outside the houses of the afflicted ones. Those that watched over the sick could not leave them for a minute. When the throat was swabbed out clean it was only a few minutes before the mouth would be filled with a horrible slime that choked the patient. Whole families died within a few days of each other. The strange thing was that as many recovered as did. Some cases were so awful that by the second or third day great abscesses formed in the throat and burst, leaving holes big enough to put a finger in. I saw several where there were such holes, one on each side of the throat, so that a man could have put his finger through the throat from side to side. Yet even some of these lived.

I was a widower at that time. My two maids, kind, capable girls, both died of the pestilence. Every one had troubles of his own and no one would come and help me. My hired man, Carl Ronningen, did all the work that was done. He had been an Army officer's body-servant for years and could do a little of everything. He cooked the meals, and washed

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and tended my sick children when I was gone on my endless rounds. I wasn't in bed for weeks . . . The epidemic went on and on. I got so tired at last that I would go to sleep if I stopped moving, wherever I might be. I even went to sleep standing on the stair, where I had stopped to listen to one of the children.

In the following years the type of reports submitted to the State Board of Health gradually changed; there was less descriptive comment than formerly and more summarization. In 1886 only one case of diphtheria was reported in Fillmore County, by Dr. J. R. De Cousens, health officer at Lanesboro. In succeeding years there were a few apparently sporadic cases; in 1896 there were thirty cases, in 1897, twenty-two, and in 1898, twenty-eight; in each year the death rate was high. By 1899 there was a sharp decrease in mortality and effort was being made successfully to reduce it further and to curb the disease.

Extension of Work in Public Health and Sanitation.—Throughout the eighties improvement and extension in the work of public health continued through local boards in every township, village and city in the state. It is notable that township boards under the new laws of 1885 had become the agents of successful local control of infectious disease both of human beings and of domestic animals, and that improvement was evident in the organization and functioning of village boards of health. Each village board had an executive officer, the health officer, who was, as required by law, a physician. Few of these men were paid. Their duties were so important and various as to require special knowledge and training. They of necessity were men of medical training and they increasingly were acquiring knowledge of the practice and principles of public health. It was now that public sanitation was stressed. In Fillmore County in the reports of J. W. Magelssen, of Rushford; J. C. Dickson, of Chatfield; R. L. Moore, of Spring Valley; J. R. De Cousens, of Lanesboro; G. A. Love, of Preston, and others, annual clean-ups were emphasized.

By the late nineties water surveys were being made, and from towns throughout the county, in the report of 1899-1900 of the state board of health, were statements from local physicians about analyses of potable and nonpotable water. In a report from western Fillmore County came two special and interesting comments relative to local geological formations in relation to public health. The first comment was with regard to the site and the wells of Spring Valley:

The town is built on the sides of an ancient gorge cut by the Spring Valley Creek. The edges of the rock strata, as exposed to the water cutting, have been so acted on by frost, air, etc. as to exhibit innumerable crevices, apparently extending far into the heart of the stratification. In several places where cellars were being dug and where other cuts had been made, these crevices were in evidence, consequently, the natural drainage would carry the effluent of the numberless cesspools and vaults in all directions from the source of pollution to the neighboring wells . . . One citizen was using an old artesian well as a cesspool and probably contaminating many of the town wells. It is surprising that there is any good water in the village.

The unhealthful conditions met prompt correction. The second comment concerned the "sink holes" referred to in the opening section of this paper:

In the limestone areas of this county are numerous depressions, known as "sink holes." These were formed by breaking through of the drift where it was spread over some preglacial rock canyon. In some places these sink holes are numerous, and often extend to great depths. In past time wounded wild animals have been known to creep into them to die, and at the present time they are (and had been for nearly fifty years) a great convenience to far-sighted rural inhabitants, who find them excellent burial cavities for domestic animals, regardless as to whether death has been due to accident, old age, or disease. These are

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also very convenient natural cesspools which never fill up. Such conditions alone might account for endless pollution of water.

By 1899 the State Board of Health of Minnesota, working with local township and village boards, was (1) giving aid in the diagnosis of certain infectious diseases, (2) in clearing up of doubtful diagnosis, and (3) in the investigation of obscure diseases. In all of these points the work related to infectious diseases of both men and animals. Not until 1901 was a law passed in the state providing for county boards of health, and that law was permissive only. In the revised laws of 1905 county boards of health became mandatory.

Conditions of Medical Practice at the Close of the Nineteenth Century

In his presidential address before the Minnesota State Medical Society, in 1890, Dr. J. H. Dunn gave an able and fascinating review of the growth of medicine in the nineteenth century, particularly in the last quarter of that century, making graphically clear the advances, now too well known to require enumeration here, in the science and art of medicine and surgery, in medical education, medical literature, medical organization and medical legislation for the protection of the medical profession and the public, especially that legislation brought about by the physicians of Minnesota acting as a body in the medical society of the state of which the county medical societies were component parts.

One further comment on laws of licensure, as related to practitioners of Fillmore County, is made here. As noted earlier, after the attempt at regulation of medical practice by legislation, in 1869, fostered by the Minnesota State Medical Society, fourteen years elapsed before further comparable effort to procure legislative enactment was made by the organization. On March 15, 1883, as the result of faithful work, there was passed "An act to regulate the practice of medicine in the state of Minnesota and to license physicians and surgeons, and to punish persons violating the provisions of this act." On February 28, 1887, this law was repealed and a new and more stringent act came into effect and, by its provision, a new State Board of Medical Examiners came into office. Under this law there were six classes of licensed physicians in the state: Those physicians licensed by the former board on presentation of a diploma from a recognized medical college; those licensed by the former board after examination in lieu of a diploma; those granted certificates of exemption by the former board by reason of practice in the state five years prior to the passage of the act of 1883; those licensed by the present board after examination under the act of 1887; those who were known to have practiced before the law of 1887 went into effect, but who had not complied with the provisions of the act of 1883; and those who had filed with the secretary affidavits that they were in practice prior to the law of 1887. In Fillmore County there were representatives of all these classes who subscribed to the new rulings, as did the physicians of the county to subsequent legislations, in 1895 and later.

In Fillmore County, from the earliest fifties of the nineteenth century to the turn of the twentieth century, there were, as nearly as can be determined, and as listed earlier in a roster, resident from a few months to many years and of all types and schools, about 135 physicians as has been suggested, there probably were many others, of whom no record remains. In the period from 1853 to 1883, inclusive, there were at least sixty-four physicians, and probably more, of whom no mention appears in the official registers of physicians licensed in the state, beginning in 1883; some of these earlier men were substantial and permanent

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citizens, others were of the itinerant or semi-itinerant type. There were thirty-four physicians who were licensed, in one classification or another, under the "Diploma Act" of 1883 and nine who received exemption certificates under that law. There were twelve licensed duly under the improved law of 1887 and three who received exemption certificates. Between 1895 and 1900 fifteen more were licensed within the county. As stated in the section, "Physicians in Fillmore County," in this paper, in the eighties and nineties various medical practitioners from adjacent and other counties in Minnesota and from Iowa and Wisconsin were licensed to practice in Fillmore County.

Biographical Sketches*

Dr. John Brown, Scottish physician, once said, "It is the lot of the successful medical practitioner to be invaluable when alive, and to be forgotten soon after he is dead, and this is not altogether or chiefly from any special ingratitude or injustice on the part of mankind but from the very nature of the case."

About a few of the physicians who are mentioned in the succeeding pages little besides their names has been learned; about others a wealth of detail has been available. All of these early practitioners had countless experiences in common, in conditions of practice and types of patients and in surroundings and natural hazards. When a relatively full story has been presented here, it has been with the thought that it applies not to the subject alone but to some extent to all of his fellow physicians of the same period and type. Perhaps too generous use has been made of excerpts from old newspapers; it has been done to make evident the editorial manners and customs of the time and to show the relation of the physician to the public. Around some of the men who were identified closely with a village or a community is woven something of the story of the settlement.

"Why not idealize the doctor some?" asked James Whitcomb Riley in his poem, "The Doctor." Whether or not we here idealize the doctor, there is in the life of every physician, as of every person, the making of a book, and about these men of Fillmore County of the nineteenth century, as about all early practitioners of medicine, many volumes could be written. These physicians, as their stories have taken form, have seemed once more to move among the scenes they knew so well. On drives through Fillmore County among those scenes, which cannot have changed greatly since their times, it has been pleasant to picture the early doctors, sometimes making their rounds on foot, often riding on horseback with their saddlebags, most commonly riding in horsedrawn vehicles, carts, sulkies, buckboards or buggies, over the prairies, up and down the hills and along the winding valleys, intent on promotion of the welfare of their communities and on the immediate care of the sick; to see in the phantom villages the thriving and hopeful little settlements that they once were, and to visualize as they were in their beginnings the prospering modern towns. If the reader will bring sympa-

*As stated in *Notes on the history of medicine in Houston County prior to 1900* (Guthrey), Mrs. George (Elizabeth West) Edward, of Canton, did preliminary field work for the Olmsted-Houston-Fillmore-Dodge County Medical Society in gathering biographical data about pioneer physicians who were long resident in Houston and Fillmore counties.

The writer has had the benefit of Mrs. Edward's biographical notes, and in addition has obtained essential background material and numerous additions to the medical roster of Fillmore County from two major sources: (1) official transactions and reports of medical organizations, medical journals, registers, directories, pertinent county records, histories and files of newspapers, old and more recent, and (2) correspondence with veteran physicians and with relatives, whenever discoverable, of early physicians now deceased; the biographical sketches, whenever reference has been possible, have been submitted and resubmitted for correction and approval.

Grateful acknowledgment is made to all of the many persons: relatives of the early physicians, officials, practicing physicians, professional workers and lay citizens, in Fillmore County and elsewhere, who have been encouraging and helpful in obtaining authentic material. A special word of thanks is expressed to Mrs. Edward; to Miss Margaret Snyder, sometime of Chatfield, who is engaged in writing a history of Chatfield, for supplementary notes; and to Mr. J. F. Meighen, of Preston, for the privilege of scanning many bound copies, long in the possession of the Meighen family, of early issues of the *Preston Republican* and the *National Republican*.

A Bibliography will appear at the close of this article.

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thetic interest, perhaps he will be able to discern in these little sketches, some of them mere notes, the living stories.

Nelson W. Allen, a native of New York State, arrived in Winona, Minnesota as a practicing physician in the fall of 1853 and, according to the late Dr. D. B. Pritchard, of Winona, was the first man to practice medicine in Winona County. He remained in that county only a short time. By the spring of 1854, one of the first physicians to settle in Fillmore County, he had identified himself with the village of Chatfield.

The Allen and the Willis families of Chatfield came to Minnesota at about the same time from Kenosha, Wisconsin. Dr. Allen's sister Harriet was the wife of Grover W. Willis, prominent citizen of southern Minnesota, who donated the land now used as the Chatfield city park. Later, Grover Willis and his family moved to Winona, where they remained, entering into the civic and educational life of the town.

Mrs. Nelson (Jane) Allen is recalled by one of her grandsons as an aristocratic woman, refined and well educated, and it may be assumed that her husband was of comparable native ability, tastes and educational advantage. Dr. and Mrs. Allen had five children, Charles became a druggist in Chicago. Mason, who enlisted in the Indian Wars in Minnesota in 1862, was a carpenter in Chatfield until 1900, when he moved with his family to Brookings, South Dakota. Mary became the wife of William Briley, a general merchant in Chatfield for many years. In later years Mr. and Mrs. Briley made their home in Dell Rapids, South Dakota. Jennie was the wife of Frank Mathews, a commission merchant in Chicago, and Minerva was married to Eugene Morrison, an official of the Chicago, Burlington and Quincy Railway Company, in Chicago.

Dr. Allen carried on an extensive medical practice in the best professional traditions of the times and was active at least through 1872, judging from entries in business directories of the period. He apparently did not use the newspapers to inform the public in detail as to his professional attainments, as was done by many medical practitioners of the day; only the name, "N. Allen, Winona Street," appeared in the listing of local physicians in the earliest issues of the *Chatfield Republican* and the *Chatfield Democrat* in 1856 and occasionally in issues of later years. There is record that in 1857 and 1858 and again in the period from 1864 to 1865, inclusive, he was a trustee on the village school board.

Born in New York State in January, 1810, Nelson W. Allen died in Chatfield on June 8, 1876, aged sixty-six years and six months. After his death Mrs. Allen made her home with her daughter, Mrs. Morrison, in Chicago.

———**Atkinson**, of Chatfield—whether his field of work was medicine, dentistry, veterinary science or the church, has not been learned—in the late summer of 1882 was killed in the course of a hunting trip in Eyota Township, Olmsted County. He was riding in a wagon when his gun fell and discharged accidentally, shooting him through the right lung.

Peter Halstensen Bakke was graduated from the College of Medicine and Surgery of the University of Minnesota in 1891 and on July 10 of that year received certificate No. 175 to practice medicine in the state. Little information has been available concerning his life and work. According to directories of physicians he was in Lanesboro, Fillmore County, in 1893; by 1895 he had transferred to Preston, about ten miles distant, and there he remained presumably through 1898. In subsequent volumes, through 1909, his name was included, "Address unknown."

(To be continued in the September issue)

President's Letter

SURVEY TO DETERMINE WHETHER U.S. CHILD CARE IS DEFICIENT

SOME proponents of national compulsory health insurance, the Wagner-Murray-Dingell Bill, and some of those favoring perpetuation of the EMIC program, the Pepper Bill, refer to the 4,217,000 selective service rejectees as evidence of the deficiency of American medicine. This criticism is made despite the fact that of this total, 701,700 were rejected for mental disease, 582,100 for mental deficiencies, 444,800 were deaf, blind, legless or armless, 320,000 were rejected for musculo-skeletal defects, 280,000 for syphilis, 220,000 for hernia and 160,000 for "eyes," leaving only 1,500,000, or one-third of the total rejected for causes possibly attributable to inadequate medical care. Also, this criticism is made despite the fact that the rejections in Great Britain, which has had national health insurance for thirty-five years, were 59 per cent of those examined over a ten-year period instead of the 30 per cent found in the United States.

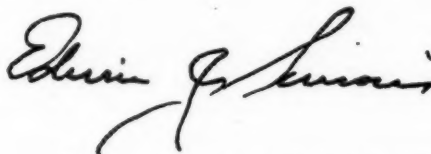
Yet the question remains, "Is the medical care of children and adolescents in the United States deficient?" One still ponders whether preventive or curative measures could reduce even this remaining one-third of rejections. There still exists the problem of both quality and quantity of medical care for this segment of the population, children and young adults. Accurate answers can only be provided by an accurate analysis and determination of the quality, quantity and distribution of pediatric care in this country. And from such factual information effective planning of the future course is possible.

One response of the profession itself to these problems has been the initiation of a survey of child health services throughout the United States by the American Academy of Pediatrics. The National Foundation for Infantile Paralysis has made a material financial contribution, and both the United States Public Health Service and Children's Bureau are collaborating by the assignment of personnel for the collection and analysis of statistical data. But, the study is being conducted under the complete control of physicians, and the sponsoring agency, the American Academy of Pediatrics, has registered its opposition to the Pepper Bill, and to the use of government funds for medical care of those able to provide care for themselves.

Under four subdivisions, the study will involve: (1) Hospital Facilities, such as general, pediatric, maternity, convalescent and tuberculosis hospitals, (2) Community Health Services, both public and private, in order to evaluate the extent and quality of general health services such as child health conferences, school health service, child guidance clinics, immunization programs and public health service, (3) Distribution, Qualifications and Activities of Professional Personnel, including data pertaining to the availability of physicians and procedures essential to complete medical care available from general practitioners, pediatricians and other specialists who care for children, and (4) Pediatric Education, as it is related to the whole broad problem in the quality and quantity of pediatric training in the sixty-six medical schools of the country. At the conclusion of the study, a report will be prepared which will be available to anyone who cares to use it. This collection of factual information will be used by the Academy of Pediatrics as a basis upon which sound recommendations for medical care programs can be made.

Here in Minnesota, the survey has the endorsement of the Council and the House of Delegates of the State Medical Association. It is to be conducted under the auspices of the American Academy of Pediatrics with Dr. Roland E. Nutting of Duluth serving as the State Chairman. An office has been established in the Division of Child Hygiene of the Minnesota State Board of Health and Dr. Viktor O. Wilson, Director of that Division, is to take an active part in the conduct of the study.

It is urgently requested that every physician fully co-operate, if and as requested, in supplying the information necessary for the successful completion of this survey. As has been said in some of the correspondence, unless physicians undertake the task, others less well qualified will, as is indicated by various bills now before Congress.



President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

DANGERS IN FEDERAL EXTRAVAGANCE

HEARINGS on the Wagner-Murray-Dingell compulsory health insurance bill have come to an end. The predominating number of those who testified favored the bill.

Nothing concrete about the cost of such a bill has been stated in the last bill under this title. A former bill submitted by the same Representatives stipulated 4 per cent tax on wages to be matched by the employer and a 5 per cent tax on income of those not on a salary basis. It was admitted by the opponents of the former bill that this would not be sufficient and that general tax funds would have to be called upon to make up the difference. An estimate has been made that this last Wagner-Murray-Dingell Bill would cost 4.5 billion dollars yearly. If cash benefits for wage loss are added (and this is most sure to follow) another 1.5 billion dollars will have to be added yearly to the tax payers' load. A large portion of this enormous cost would be spent in maintaining a governmental bureau involving some 120 million of the 140 million population of the country.

As has been the experience in all other countries which have embarked on this type of medical care, benefits and costs have increased with time, and there is every reason to believe from our own experience with governmental bureaus and political pressure that the same would occur with us.

It should be remembered, too, that the indigent would not be covered but would have to be provided for by additional taxation, as at present.

Human nature being what it is, individuals being able to get something for nothing (taxes being forgotten), needless demands on the medical profession would enormously swell the volume of practice. If free choice of physician should be allowed, the demands on the services of some physicians could not be met. If, on the other hand, physicians were designated, many would be dissatisfied and not avail themselves of their rights.

Compulsory medical insurance administered by the government resolves itself into the larger question as to whether private industry is to survive or whether the government in these United States is going to provide more and more for the needs

of its citizens through high and still higher taxation. Increased taxation means less capital for new and expanding industry. This, in turn, results in a reduction in funds collected through taxation, and a vicious circle is established. The eventual result must be a communistic state with the government taking over all industry. Do we have to wait for more yearly deficits and a further mounting national debt before our legislators realize the danger? It would seem so.

In the meantime, Congress goes merrily along appropriating additional millions and billions and even seriously considering such legislation as the Wagner-Murray-Dingell Bill, the Pepper Maternal and Child Welfare Bill, an appropriation of \$3,000,000 for a fertilizer plant to be built and operated by the government at Mobile, Alabama, et cetera.

The medical profession is not entirely obstructionist, as is claimed, to federal subsidy for certain health measures contained in the Wagner-Murray-Dingell Bill. It favors federal assistance in expanding the field of Public Health, the medical care of the indigent and adequate support of scientific research. It favors an extended program of disease prevention on national, state, and local levels. It also favors federal assistance to the states to enable each state to provide and maintain services and facilities for promoting the physical and mental health of mothers and children when the need can be shown.

The profession also favors the principle of prepayment medical insurance to relieve the burden of certain illnesses. It is emphatic, however, in its belief that this should be voluntary in character. The marked growth in hospital insurance argues that medical insurance should prove just as popular. In fact, medical insurance already established by state and local medical societies is rapidly expanding. Already thirty-one states have prepayment medical plans in operation or about to go into operation. The profession believes this is the American way of meeting the problem.

New Zealand is an example of how high wages, short business hours and liberal holidays, maternity and family benefits, free education, free

health services and old age pensions serve to create and maintain such high taxes that industry is throttled. Taxes in Canada and England are probably higher than in our country, and political movements in these countries do not indicate a downward trend in taxation. Unless Congress and the people of the United States realize the throttling effect of high taxes on private industry and the necessity of reducing federal appropriations our national economy is headed for socialism and even communism. The American people do not want either.

STREPTOMYCIN

STREPTOMYCIN, the more recently discovered antibiotic, promises to become a valuable addition to the antibiotic penicillin.

Streptomycin was first isolated by Waksman in 1944 from *Streptomyces griseus*, a strain of *Actinomyces*. It was Waksman who had isolated streptothrycin in 1944 from *Streptomyces lavendulae*, another group entity of *Actinomyces*. It seems that the *Actinomyces* are not a true mold but have characteristics similar to molds and bacteria. Streptomycin proved to be of more therapeutic value than streptothrycin.

It has been known for some time that earth must contain antibacterial substances. Otherwise it would be overrun with a great variety of bacteria. It is now known that earth contains antibacterial substances, some harmful but some such as that contained in certain *Actinomyces* not harmful to body cells.

Streptomycin has been found to be bactericidal to certain Gram-negative organisms not affected by penicillin. It has saved the lives of individuals with *Escherichia coli*, *Aerobacter aerogenes*, *Salmonella bacteremia*, *tularemia* and *Klebsiella pneumoniae meningitis*. Its value in typhoid fever, brucellosis, tuberculosis and leprosy has not yet been proved. It seems promising in urinary tract infections from gram-negative organisms, in influenza meningitis and in pertussis. As it is also effective against certain gram-positive organisms, it may prove more effective in certain mixed infections than penicillin.

While streptomycin is administered much the same as penicillin, intramuscularly, intravenously, orally and intrathecally, there are certain therapeutic differences. The unit of dosage of streptomycin is one microgram, the drug is more slowly absorbed and more slowly excreted and is in-

clined to be more toxic. Some toxic action with fall in blood pressure has been reported following intravenous administration. More serious toxic effects have been on the vestibular portion of the eighth cranial nerve causing deafness, dizziness and tinnitus. These results, however, have followed large and prolonged dosage and have cleared in time.

Streptomycin is not yet on the market. All production is allocated to the Army, Navy, U.S.P. H.S., Veterans Administration, and to the Committee on Chemotherapeutics and Other Agents of the National Research Council. This committee has charge of the chemical evaluation of streptomycin, not only in large scale organized studies but by individual physicians in emergency cases. Evaluation of streptomycin is to be made before it will be available to the profession at large. Requests, however, for its use in certain cases may be made to Dr. Chester S. Keefer, Evans Memorial Hospital, 65 East Newton Street, Boston, Massachusetts, chairman of the National Research Council Committee.

ANTHALLAN

CONSIDERABLE publicity has been given to the new drug anthallan in the treatment of hay fever and vasomotor rhinitis. Developed by the Research Division of the Medico Chemical Corporation of America, New York City, a report by Ghoselin* of its use in a selected group of forty-two individuals treated in the out patient department of the Columbia University Presbyterian Hospital Medical Center in New York has appeared. This is the only report which, to our knowledge, has appeared. No sooner was it published, than it was heralded in the lay press and over the radio as a new "cure" for hay fever.

Acceptance of a new remedy for general use by the profession should depend on more convincing proof in the form of more extensive trial. Anthallan may or may not be a great discovery. Fortunately, it is not generally available and should not be generally prescribed until confirmation of its value and lack of deleterious side effects have been made. Here, again, is another instance of the value of the newly constituted Therapeutic Trials Committee of the AMA, whose function is to evaluate new remedies for the information of the profession.

* Ghoselin, A. D. J.: The treatment of seasonal and non-seasonal hyperesthetic rhinitis with anthallan. *Bull. New York Acad. Med.*, 22:320, (June), 1946.

COMMITTEE REPORTS

AN IDEAL TUBERCULOSIS CASE-FINDING PROGRAM

Report of Subcommittee of the Committee on
Tuberculosis
Minnesota State Medical Association

Preface: In 1938 the Committee on Tuberculosis of the Minnesota State Medical Association seriously considered the development of a state-wide tuberculosis control program to be directed by the Medical Association. During numerous meetings all phases of tuberculosis work were discussed, and the committee members finally agreed unanimously upon certain procedures which could be recommended to the physicians of the state. These recommendations and other considerations were published in the October 1942 issue of MINNESOTA MEDICINE under the title, "The Tuberculosis Program of the Minnesota State Medical Association." Practically all of the information and recommendations contained in that report are still valid.

During the past few years, mass surveys have become popular throughout the nation and our Committee on Tuberculosis has had inquiries from physicians of several counties regarding the efficacy of the various methods employed in tuberculosis control. Thus, it seemed desirable for the Committee to prepare recommendations which might be made available to every physician. Therefore, in June, 1945, Dr. Ruth E. Boynton was asked to assume the chairmanship of a subcommittee to study the problem carefully and prepare the recommendations which would be of practical value to Minnesota physicians. Dr. Boynton accepted the chairmanship and Drs. S. S. Cohen, E. A. Meyerding and C. G. Sheppard were appointed as the other members of this subcommittee. Tuberculosis surveys in Minnesota were not new. Indeed, a vast store of information was available for the study of the subcommittee.

Although tuberculin testing surveys had been conducted among cattle in the 1890's, the first survey as such among humans was done by Lampson in 1912. Slater achieved wide fame through a survey reported in 1924. An outstanding contribution was made by Simons and Hilleboe in 1931. Harrington surveyed the entire personnel of the Minneapolis school system, as well as more than 25,000 children. Burns and Hilleboe carefully investigated the tuberculosis situation among personnel and patients of all state institutions for the mentally ill. Jordan had surveyed the population of the four counties which his sanatorium serves. Diehl and Boynton had conducted most careful surveys on approximately 50,000 University students since 1928. Danielson and Sheppard in co-operation with the other physicians of their medical societies had undertaken country-wide surveys. Over the past twenty years Meyerding had directed surveys on tens of thousands of individuals. Geer had made important observations, particularly among high school students and nurses. Hedberg and Davies had undertaken to survey the 200,000 citizens of St. Louis county. The

Hennepin County Tuberculosis Association and the County Medical Society had conducted surveys among certain groups such as high school students. Nearly all of the sanatorium superintendents have done surveys in their respective districts for many years. If space permitted, a much longer list could be presented. Suffice it to say that every possible method of case finding and every known survey procedure had already been employed in Minnesota.

From an analysis of the available data in Minnesota and elsewhere, Dr. Boynton made the report for her committee in April 1946. This was approved by the Council and the House of Delegates of the Minnesota State Medical Association.

J. A. MYERS, M.D., Chairman
Committee on Tuberculosis

Subcommittee Report

This subcommittee was asked to study available data on procedures used in case-finding programs for tuberculosis and to make recommendations for procedures that might be carried out by the county and district medical societies.

The committee believes that it would be well first to outline what might be accepted as an *ideal* case-finding procedure, then present several less complete types of programs which have been used, pointing out the advantages and disadvantages of each.

It is our opinion that each medical society should plan its own program according to the local situation. What information this committee may give to the local societies will act simply as a guide and not as a specific plan to be used on a state-wide basis.

General statement: The two general types of tuberculosis case-finding programs now in use are (1) the use of the tuberculin test, followed by a chest x-ray of those who react to the tuberculin, and (2) the chest x-rays of all individuals in a group without previous tuberculin tests. Neither of these methods will permit a definite diagnosis of tuberculosis without further diagnostic procedures, such as the patient's history, a careful physical examination, an examination of the sputum and other laboratory aids.

RUTH E. BOYNTON, M.D., Chairman
SUMNER S. COHEN, M.D.
E. A. MEYERDING, M.D.
CHARLES SHEPPARD, M.D.

An Ideal Tuberculosis Case-Finding Program

1. Tuberculin test all persons in the community with at least the first test dose of P.P.D. or O.T., or the two-test dose of either P.P.D. or O.T.
2. X-ray all reactors to tuberculin. It is desirable to do a chest x-ray on all of the people in the community, regardless of the tuberculin reaction, not only to detect tuberculosis but because of the other pathologic conditions of the heart and lungs which may be found on a

COMMITTEE REPORTS

routine chest x-ray. If it is not possible to x-ray all individuals, at least all reactors to tuberculin must have an x-ray of the chest.

3. Arrange for a follow-up study of all contacts of those who react to tuberculin to determine if possible the source of the tuberculous infection.

4. An annual chest x-ray of all over twelve years of age who react to the tuberculin test, or more frequently if indicated.

5. Repeat the tuberculin test on all non-reactors every one to three years if the local situation warrants.

6. Arrange for medical and sanatorium care for any active cases of tuberculosis found.

Recommended Procedures When Ideal Program Is Not Possible

If possible to carry out this ideal program in every part of Minnesota, tuberculosis could be eradicated in a relatively short time. Such an ideal program, however, is not practical for most communities because of the lack of sufficient doctors, the expense involved, and other factors. Much can be accomplished, however, by utilizing those parts of this ideal program that can be carried out with existing personnel and funds. Some of the methods that have been used and which may serve as a guide to other communities are suggested:

1. *Tuberculin test and chest x-ray of reactors.* In Meeker and McLeod Counties the medical societies have set up programs attempting to do a tuberculin test on all people in the community and arranging for the chest x-ray of reactors to be done in the physician's office. In both counties the tuberculin tests are also done in the doctors' offices.

Advantages: The patients come to the doctors' offices for the tests and x-rays. If any pathology is found, the physician has immediate and direct contact with the patient and can arrange for care.

Disadvantages:

- It is often difficult to motivate people to come to the physician's office when well for any routine procedure of this kind.
- Therefore, this type of survey is necessarily slow.
- It is time-consuming for the busy physician, and therefore interest may lag after a certain length of time.

In some counties the county medical society has arranged with the county nurse or other public health nurse to do the tuberculin testing, with the reactors coming to the physician's office for the chest x-ray.

Progress may be made with a less ambitious type of program in which only certain age groups are selected for the tuberculin test. Testing of certain school age children has been found to be of value. School children are easily available in groups for testing. If a program of testing school children is planned, those ages should be tested in which the tuberculin test will be of most value in finding active cases of tuberculosis. If all of the school children cannot be tested, probably grades one, eight, nine and twelve will be most productive of results.

X-rays should be taken of all reactors over the age of twelve. A home follow-up should be done, however, on

all reactors of all ages. The chest x-ray is not advocated for first grade children because of the negligible number who will be found to have shadows. The home follow-up for these young children is, however, very important, as the examination of home contacts of the child who reacts to tuberculin will frequently uncover an unsuspected, active case of tuberculosis.

The x-rays may be done in the doctor's office, in a hospital, in a county sanatorium, if one is available, or by means of a mobile photofluorographic unit.

All of the reactors over twelve years of age should be re-rayed annually or more frequently if indicated. Children previously nonreactors should be retested every one to three years.

The *advantages* of this type of program are:

- It identifies the children who have become infected, as shown by a reaction to the tuberculin test, so that these children may be kept under observation.
- It permits further study and follow-up of contacts of these reactor children, thus leading to open cases of tuberculosis which might not be found otherwise.

Disadvantages:

- To give the tuberculin test is time-consuming.
- The test must be read forty-eight to seventy-two hours after it is given.
- There are always some people who object to having any test which requires the injection of foreign material.

2. *The use of a chest x-ray on all members of a community without previous tuberculin testing.* This has been done in some places, using the regular 14 by 17 film. More recently there has been developed the photofluorographic portable unit, using either a 35 or 70 millimeter film or a 4 by 5 film. With such a portable unit and an adequate staff, a large percentage of the population of a county can be x-rayed in a relatively short time. At present St. Louis and Hennepin Counties are the only places in Minnesota that have portable photofluorographic units in operation. The Minnesota Department of Health expects to have one or more of these units available in the near future. Ramsey County also will have two such units. When such x-ray surveys are done, a tuberculin test should follow the x-ray in every case in which any x-ray shadows are found.

Advantages:

- It is possible to obtain a chest x-ray on large numbers of the population in a relatively short time and at relatively little cost.
- If a large enough proportion of the population receives a chest x-ray, most of the active cases of tuberculosis will be discovered and immediately taken out of contact with the public.
- Non-tuberculosis pulmonary pathology, as well as cardiac pathology, will be found.

Disadvantages:

- Without the tuberculin test no knowledge is obtained as to whether the individual has been in-

COMMITTEE REPORTS

- fectured with tubercle bacilli and therefore needs closer observation than the person not infected.
- (b) Without knowledge of the tuberculin reaction, shadows in the lungs may be misinterpreted.
 - (c) At the present time there are not enough portable units and personnel to man the units to make a state-wide program possible.

Minnesota State Medical Association Committee on Tuberculosis

J. A. MYERS, M.D., Chairman
R. N. BARR, M.D.
RUTH E. BOYNTON, M.D.
JOHN BRIGGS, M.D.
H. A. BURNS, M.D.
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E. K. GEER, M.D.
G. A. HEDBERG, M.D.
H. C. HINSHAW, M.D.
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T. J. KINSELLA, M.D.
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K. H. PFUETZE, M.D.
C. G. SHEPPARD, M.D.
S. A. SLATER, M.D.
W. H. UDE, M.D.
W. H. FELDMAN (Ex Officio)

REPORT OF DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION

The convention held this year in San Francisco July 1-5, 1946, was like a revival of the old-timers of the American Medical Association. The scientific exhibits were not quite up to par because of the shortness of time between the end of the war and the exhibits. Particularly outstanding, however, were the exhibits of the Army and the Navy, especially that of the Army.

The meeting of the American Medical Association was not very colorful this year, but it did bring out certain things which apparently are quite fundamental and probably have been brewing for some time.

It is remembered that last year the trustees were ordered to hire a National Research Agency to make a complete analysis of the proceedings and the affairs, internal and otherwise, of the American Medical Association.

The Rich Institute was chosen for this purpose and the report is now in the hands of the trustees. It concerns, as far as we can determine, two main factors. One was the question of the reorganization of the internal affairs of the Association, and the other, dealt with the relations of the AMA with the public.

The first consideration of the report was to the effect that the internal affairs of the Association be divided into three parts. The first had to do with the editorial phase of its work. It was decided that Dr. Fishbein would confine his time to the editing of the *Journal* and its other publications. The second dealt with economics. An expert on economics is to be employed who will be expected to follow out recommendations made in the Rich report. The third question involved public relations. An expert, who shall be under the direct supervision of the general manager, Dr. Lull, secretary of the American Medical Association, is to be employed to correlate all the activities of the AMA.

All of the delegates appeared to be quite well pleased with these recommendations and their adoption. It is recalled that for some years the California delegation particularly has been critical of the public relations as directed by Dr. Fishbein. The action taken by the House this year will eliminate that criticism and everyone seemed to be well satisfied with the new setup.

With reference to medical economics, everyone seemed to concur in the opinion that the present legislation before Congress is not in proper form and all states should start setting up voluntary health insurance and thus get at the roots of the fundamental weakness existing at the present time. The general opinion seemed to be that the program of voluntary health insurance adopted by the states would be well received by Congress.

As far as resolutions are concerned, the session had nothing very revolutionary to offer except the routine business. The name of the Council on Medical Service and Public Relations will be changed dropping the words "Public Relations," as public relations will be operated under a separate department in the headquarters office as alluded to previously.

The County Society of San Francisco provided very interesting entertainment for the delegates when not occupied with business sessions.

The delegations from the coal mining regions of West Virginia, Pennsylvania and neighboring coal states were very much concerned over late developments in the settlement of the recent coal strikes. The large welfare fund to be paid by Mining Companies on a tonnage basis worried the doctors, since this may be just the beginning of socialized medicine in localized areas. A committee was appointed to investigate and keep close tab on the changes.

Attention is called to the National Bituminous Wage Agreement appearing on page 917 of the July 13 edition of the *AMA Journal*, which should be read by every person who is interested in social insurance, because of its vast implications in the possible trends of organized labor and medicine.

Dr. Ray Lyman Wilbur retired as chairman of the Council on Medical Education and Hospitals, a position which he has held since 1925 with the exception of one year when he was President of the American Medical Association. A very fine tribute was paid to him for the untiring efforts he has made in promoting medical education and the affairs of this committee.

It was voted at this meeting of the House of Delegates that two sessions of the House of Delegates should be held each year because the gap of one whole year between meetings is too long an interval when so many national medical problems are arising.

Another interesting item was the resolution passed urging the limitation of the constitution of the Health Organization of the United Nations to problems related only to preventive medicine, standardization of drugs and biologic preparations and the prevention of dissemination of disease between nations, the practice of medicine being entirely excluded from any of the activities of the health organizations of the United Nations.

In the election of officers, Dr. Olin West was named president-elect. There was a spirited contest in the election of the Speaker of the House, Dr. Roy W. Fouts of Omaha winning re-election.

The 1947 meeting of the American Medical Association, its regular annual session, will be held at Atlantic City, New Jersey; the 1948 meeting will be at St. Louis, Missouri.

A. W. ADSON, M.D.
W. A. COVENTRY, M.D.
E. W. HANSEN, M.D.
F. J. SAVAGE, M.D.

Delegates to the American
Medical Association

MINNESOTA MEDICINE

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics

of the

Minnesota State Medical Association

George Earl, M.D., Chairman

AMERICAN DOCTORS EVIDENCE UNITY AT AMA ANNUAL SESSION

Unity of thought and purpose—to preserve the American system of medicine—marked the ninety-fifth annual session of the American Medical Association, held in San Francisco, July 1-5, 1946.

The great strides in the scientific field which the profession has made during the past year were matched by the earnestness with which doctors have been working to perfect a country-wide plan for voluntary prepaid medical service. This was evidenced both in the reports turned in, summarizing the year's activities, and in the thoughtful discussions presented by the Association leaders, indicating their keen awareness of the problems facing medicine today.

Attendance at the session exceed 7,500; and the weather was magnificent, making the session, all in all, a highly successful one.

During the year, the association has advanced its own prepaid medical care plan, a voluntary one, as opposed to the Wagner-Murray-Dingell bill, which would nationalize medicine on a compulsory basis.

According to Dr. E. J. McCormick of Toledo, Ohio, chairman of the AMA Council on Medical Service and Public Relations, prepaid medical plans have been set up by associations in thirty-one states with twelve others completing plans.

It is the goal of the AMA that all of these plans be tied together under a national setup so that subscribers to the plan in one state may transfer or receive care from the organization in another state.

Calls for "Medical Statesmanship"

In an address keynoting the sessions, retiring president, Dr. Roger I. Lee, called for more "medical statesmanship" from doctors, declaring that doctors have a right to sit at the "council table." He challenged the younger doctors of

America to fight for control of their profession at a time when a changing order in medical practice is coming to pass.

Dr. Lee acknowledged the fact that "governmental interest may be benevolent, at least in intent," but he said that the AMA is bitterly opposed to governmental control of medicine.

It is nothing short of a grievous calamity that so few doctors are able to combine the practice of medicine and public office, he said. Physicians, with their knowledge of poverty, disease, suffering and sin, should have a voice in governmental affairs, not just as specialists to sit in the next room and be called in for consultation as a last resort.

Dr. Harrison H. Shoulders, Nashville, Tenn., president-elect, affirmed Dr. Lee's statements, warning that in this period of reconstruction "political crackpots, yearners for political power, enemies of freedom and importers of alien philosophies of government find favorable opportunities for their most strenuous activities." He also urged AMA delegates to lend freely the knowledge and experience of the AMA to veterans and veteran organizations so that "sound medical policies can be adopted in the interests of the veteran, the public and the medical profession."

"This association," said Dr. Shoulders, "is interested in making high quality medical care available to all people at a cost within their reach and without interposition of a government agency between a patient and his doctor."

Future of General Practice Cited

A warning that the general practitioner, not the specialist, is the basis of U. S. medicine, and should the general practitioner disappear so will the entire American system of medicine, was sounded by Dr. Wingate M. Johnson, Winston-Salem, North Carolina, in an address before the delegates.

Dr. Johnson was confident, however, that the family doctor *will* survive—that he won't "stay buried"—because there is room for both specialist and general practitioner.

"Just as the general contractor will sublet responsibility for plumbing, heating, lighting and highly specialized work," Dr. Johnson explained, "so the family doctor will refer cases requiring special skills to those who are trained to handle them.

"If the family doctors do not survive there is little chance for a free medical profession to survive; in normal times the average citizen cannot afford to go from one specialist to another unless the government pays the bill."

In recognition for devoted service to American medicine, Dr. Olin West was elected by the delegates to the presidency of the association. Having served nearly a quarter of a century as secretary and general manager of the AMA, and but recently retired from that office, Dr. West was unopposed for the office.

In his first address to the delegates as president-elect, Dr. West hit at various charges and rumors as to the hierarchy that supposedly exists in the association.

Said Dr. West: "I have been a member of the AMA for close to fifty years. Through that period I have been in close contact with the organization and its workings. I have looked for a hierarchy since I first heard it mentioned and, if I understand the meaning of the word, I have never found it."

Variety of Resolutions Introduced

Resolutions presented on the floor of the House of Delegates covered a variety of subjects. Among those winning out in the final action of the delegates were measures condemning various congressional bills calling for federal control of medicine, the Wagner-Murray-Dingell Bill, and the Pepper Bill. The bill, introduced by Senator Robert Taft intended as a substitute measure for the Wagner-Murray-Dingell proposal, was catalogued by the delegates as "still in the formative stage." Recommendations were made for the appointment of a committee to confer with the authors of the Taft Bill.

A resolution, asking that the United Nation's health organization concern itself only with problems related to prevention of dissemination of disease between nations, was adopted. It specified

that all matters pertaining to the nature of medical practice in individual nations be left to the nations themselves.

It was resolved that the House of Delegates recommend that each state medical society assume leadership in developing adequate mental disease programs within the state and that all state organizations co-operate with each other and with allied groups to further research activities in the field of mental diseases and to improve the care of the mentally ill.

The delegates voted to look with favor upon industrial health activities advanced by management and labor, such as the national bituminous wage agreement, and adopted a resolution demanding that scientific and ethical medical standards be maintained in such programs.

VOLUNTARY PREPAYMENT MEDICAL CARE PLANS PROGRESS RAPIDLY

A recent bulletin published by the Council on Medical Service and Public Relations and the Bureau of Medical Economics of the American Medical Association reports on the status of voluntary prepayment medical care plans in the United States the data having been obtained directly from executives of each of the plans.

Besides giving a brief résumé of the major features of forty-five individual plans, the booklet traces the growth and development of voluntary prepayment medical service, which it describes as a relatively new organization. It is reported that the growth in the number of plans and in the number of states in which plans are either operating or in the process of development is satisfactory, in fact, beyond the hopes of many six months ago. The bulletin says that from 1939 to 1946 medical plans have enrolled 2,845,000 subscribers.

Among the thirty-one states with voluntary prepayment medical care plans in operation by May, 1946, there are fifty-one different plans included. Twenty-three states have only one plan each, in most cases state-wide. Four states have two plans each, a state plus a local plan, or two plans dividing the state. Three states have three plans; one state has five and one six. Thirty-four of the plans operate in co-operation with Blue Cross. Minnesota is one of the nineteen states listed with plans not yet complete or in the process of organization.

Plans Must Meet Council Standards

In order that prepaid medical service plans in the country shall be organized and operated in accordance with standards which adequately protect the interests of the public and the medical profession, the Council on Medical Service and Public Relations is granting special recognition, the council seal of approval, to all plans meeting the following requirements: (1) local approval, (2) professional control, (3) provision for arbitration to adjust complaints, (4) free choice of physician, (5) retention of traditional doctor-patient relationship, (6) adequate dues through premium rates, (7) provision for the greatest possible benefits in medical care to subscriber, (8) statement of benefits in terms of cash indemnity or service units, (9) clear statement of conditions and benefits on contract, (10) reasonable and truthful promotional activities, (11) sound, actuarial enrollment practices, and (12) conformity with state laws, as well as foundation on an insurance accounting basis, with an appropriate state authority supervising operation. The council requires that each accepted plan must submit periodic reports of financial and enrollment details; and it stipulates that its acceptance of plans will be for a period of two years, or until revoked. Any changes in contracts or literature during the period of acceptance must be submitted to the council for review.

The council has formulated these principles and standards for guidance. This approval carries the privilege of using the "Seal of Acceptance" of the Council on Medical Service and Public Relations. This, the Blue Shield, should provide a simple descriptive phrase for identifying the program to the public.

A year ago, the bulletin states, the biggest problem in the prepayment medical care program was stimulating the state and county medical societies to organize plans. This problem is now well on the way to solution. The big question now is that of devising ways and means for increasing enrollment. The emphasis during the remainder of 1946 should be on the education of the public to the advantages of enrolling themselves and their families in voluntary prepayment medical care plans.

ROCHESTER COLLEGE OFFERS FIRST COURSE IN OPTICS

The Junior College of Rochester, Minnesota, will inaugurate a course in ophthalmic optics, the first of its kind, this fall as a part of its regular curriculum.

The two-year course, which is to train a limited number of carefully selected persons in the intricacies and details of the making, fitting and other mechanical skills concerned with the use of visual aids such as spectacles and eyeglasses, will be taught under the supervision of Dr. Charles Sheard, director of the division of physics and biophysical research of the Mayo foundation, Dr. Sheard is internationally known for his writings and research in visual optics.

Dr. Sheard in commenting upon the course has noted that for several decades there have been great advances in the professional and scientific phases of the problems and care of human vision. According to him, the most outstanding advances in the care of the eyes and the development of the finest courses of training have been made in this country.

"Side by side with this professional development and advancement," says Dr. Sheard, "has come a corresponding growth and progress in the mechanical and material phases of vision."

Course to Serve as Pattern

Dr. Sheard believes that this course at Rochester is a distinct contribution and that it may well serve as the pattern for the establishment of a limited number of similar courses in junior colleges or technical institutes in the United States.

The first year of the course covers fundamental science and mathematics with an introduction to the making of lenses. The second year is devoted mainly to the completion of training in mechanical optics and a thorough acquaintance and grounding in all phases of ophthalmic optics, since the making of modern visual aids has developed into an exact science.

Subsequent to this formal training it is expected that the student will serve an apprenticeship with some manufacturing or wholesale optical company and that on satisfactory completion of college and practical training, the person may be certified as a master ophthalmic optician.

The need for properly trained opticians has been cited as more pressing than ever during this postwar readjustment period. Possibilities of positions cover dispensing opticianry, association

with manufacturing and wholesale organizations, and other contacts with ophthalmologists and optometrists,

A leading optical company has offered eight scholarships to cover fees and tuition of the second year of the course. Laboratory facilities available and placement in apprenticeships at present have limited the number who can be admitted to eight persons. The company will place in its own organization or elsewhere all who successfully complete the two-year curriculum.

COMMITTEE MEETS ON VETERANS FEE SCHEDULE AND CONTRACT

The fee schedule and proposed contract between the Veterans Administration and the Minnesota State Medical Association was the subject of a meeting of the Medical Advisory Committee on Veterans Affairs, July 15 at Hotel Saint Paul.

The committee met to make whatever revisions in the fee schedule and the contract were necessary, according to recommendations made by the various organizations of the specialties represented in the state, to which the fee schedule was submitted upon direction by the House of Delegates at its May meeting.

In an effort to give the specialty groups a chance to present what they consider fair rates for services rendered, the fee schedule was submitted to the following Minnesota organizations: the Minnesota Dermatologic Society and the Mayo Clinic Dermatologists; the Minneapolis Regional Chapter, American College of Physicians and Surgeons; the Minnesota Academy of Internal Medicine and the Mayo Clinic Internists; the Minnesota Academy of Ophthalmology and Otolaryngology; the Minnesota-Dakota Orthopedic Association; Pathologists Kano Ikeda of St. Paul and A. H. Wells of Duluth (since the state society is inactive); the Minnesota Radiological Society and the Mayo Clinic Radiologists; and the Surgical Societies of Minneapolis, St. Paul and Duluth, as well as the Mayo Clinic Surgical group.

The contract to be negotiated with the Veterans Administration was approved by the committee. After obtaining the approval of the council, as directed by the House of Delegates, the next step is to get the approval of the regional office of the Veterans Administration in Minneapolis. Following that, the contract and schedule will be sent to the Washington office of the Veterans Administration for national approval.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary
230 Lowry Medical Arts Building
Saint Paul, Minnesota

Minneapolis Woman Pleads Guilty to Criminal Abortion

Re: State of Minnesota vs. Marie Edmund

On June 12, 1946, Mrs. Marie Edmund, fifty-four years old, 400 Ridgewood Avenue, Minneapolis, entered a plea of guilty in the district court of Hennepin county to an information charging her with the crime of abortion. The case was referred to the probation officer for a pre-sentence investigation and on June 29, 1946, Mrs. Edmund was sentenced by the Hon. Frank Reed, Judge of the district court, to a term of 4 years in the Women's Reformatory at Shakopee. Judge Reed stayed the sentence and placed the defendant on probation for five years. Judge Reed strongly rebuked Mrs. Edmund for her illegal activities and warned her that if she violated the terms of her probation she would serve her entire sentence. Judge Reed also forbade Mrs. Edmund from doing any nursing or massage work in the future. The Court was asked to impose such restrictions by the Minnesota State Board of Medical Examiners.

Mrs. Edmund was arrested June 9, 1946, by Minneapolis police officers after two Minneapolis women had been admitted to General Hospital suffering from the after-effects of criminal abortions. Both women gave statements implicating Mrs. Edmund. Mrs. Edmund, a widow and the mother of three children, has been quite prominent in women's activities in Minneapolis. In a signed statement she admitted having been an abortionist for the past four years and that she had performed four criminal abortions in May, 1946, receiving \$125 for the abortion she pleaded guilty to in court.

Mrs. Edmund told the court she was born in Zurich, Switzerland, in 1891 and moved to Hong Kong, China, in 1909; married in 1918 at Shanghai and came to Wheeling, West Virginia, in 1921. She further stated that she came to Minneapolis in 1922 and has been operating a rooming house at 400 Ridgewood for several years. She admitted that she has no license to practice any form of the healing arts but claims to have done massage work and practical nursing.

Red Wing Parolee Arrested for Illegal Practice of Medicine

Re: State of Minnesota vs. John George MacArthur.

On June 22, 1946, John G. MacArthur, eighteen years of age, 2915 Dean Blvd., Minneapolis, was arrested by Minneapolis police officers on a charge of practicing medicine without a license. MacArthur was arrested at the Lake Calhoun swimming beach where he was posing as a doctor at the first aid station. MacArthur stated he had studied medicine in France and at the University of Minnesota. Both statements are false. MacArthur's only acquaintance with the practice of medicine was as an orderly at two of Minneapolis' hospitals.

MacArthur's record shows that he was adjudged a delinquent in the juvenile court of Hennepin County July 31, 1942, following the theft of a radio and an electric fan. He was placed on parole and then stole some jewelry from a Minneapolis home he had illegally entered. For that offense he was committed to the State Training School at Red Wing on September 25, 1942. He was paroled from there August 24, 1943.

In the present case, MacArthur was ordered returned to the State Training School at Red Wing. He will not be released until his father who is employed at Louisville, Kentucky, makes arrangements to place him in a private school.

MINNESOTA STATE MEDICAL ASSOCIATION

House of Delegates

Saint Paul Session—May 19-20, 1946

In accordance with action taken by the Council in 1944, publication of the proceedings of the annual session of the House of Delegates is limited to summary. Proceedings have been mimeographed in complete form and sent to each of the delegates.

HOUSE OF DELEGATES

First Meeting, Sunday, May 19, 1946

Continental Room, Hotel Saint Paul

Saint Paul, Minnesota

The Ninety-third Annual Session of the House of Delegates of the Minnesota State Medical Association convened in the Continental Room of the Hotel Saint Paul, St. Paul, Minnesota, at 10 a. m., Dr. W. A. Coventry, Duluth, Speaker of the House of Delegates, presiding.

Speaker Coventry called the meeting to order and asked for the preliminary report from the *Credentials Committee*, Dr. C. L. Roholt, Waverly, Chairman. Dr. Roholt reported that a quorum was present, after which the Speaker called upon Dr. F. J. Elias, Duluth, for the report of the Chairman of the *Council*.

DR. ELIAS: The first meeting of the Council in connection with the annual session was held on Saturday, May 18, at 2 p. m.

Separate motions were made and carried approving affiliate membership for: Catherine C. West, Minneapolis; Harry Winslow Allen, Minneapolis; John J. Ederer, Minneapolis; Joseph M. Hall, Minneapolis; Emma F. Michelson, Minneapolis; Jalmar H. Simons, Minneapolis; Henry E. Binet, Grand Rapids; Dana C. Rood, Minneapolis; Oscar Kozberg, Denver, Colo.; Roy M. Mayne, Duluth; and Zachariah E. House, Burbank, Calif.

With reference to membership dues, it was voted that the \$5.00 assessment be continued for another year, and that the Council recommend to the House of Delegates that Article IX of the Constitution be amended to make the assessment permanent.

A resolution passed unanimously by the *Committee on Tuberculosis* advocating the retention of Tuberculosis work at Fort Snelling Hospital was approved.

It was suggested that the names of Drs. Charles H. and William J. Mayo represent Minnesota in the Hall of Fame at Washington. This will be further considered at the next meeting of the Council.

Regarding dues of members in good standing who have returned from military service and are taking fellowships, it was decided that discharged servicemen will be expected to pay dues for the year following that in which their terminal leaves expire.

A suggestion from the Committee on National Emergency Medical Service of the American Medical Association that a committee of seven members to be known as the Committee on Military Service be appointed was turned over to the *Committee on Military Affairs*.

The Council approved that Dr. Adson and Dr. Coventry succeed themselves as members of the House of Delegates of the AMA and that Dr. Hultkrans and Dr. Burnap succeed themselves as alternates.

Speaker Coventry then called for the financial report from Dr. Louis A. Buie, Rochester, Chairman of the *Finance Committee*.

DR. BUIE: The steady growth in the figures representing net worth of the Minnesota State Medical Association demonstrates that expenses have been subject to conservative control relative to income from all sources, and the result has been an expansion in the net worth of the organization which has been almost constant. Although those who are in a position to give expert opinion will attest that our financial position is satisfactory, we should not assume that we can relax our vigilant efforts toward increasing the stability of our financial condition. We contribute to many worthy projects in substantial amounts, but thus far we have been fortunate in that we have been spared any cataclysmic financial assault. During these chaotic times, I am sure that none would feel that such a possibility can be disregarded.

The investment portfolio of the Association has been subjected to the closest scrutiny of auditors and advisors in finance and from them your Finance Committee has learned that there is little which affords opportunity for adverse criticism. . .

Any success which has attended the activities of the Minnesota State Medical Association in the management of its financial affairs has been owing to the sound business principles which have been followed. The principles have been established because of the vision and capabilities of our confreres and our predecessors. Among the most important of their practices have been (1) the careful control of expenses by budgetary procedure, (2) conservative investment practices and (3) independent audit of all accounts.

An analysis of the income and expenses of the Association covering the period from 1933 to 1945 demonstrates that all of the trends in the affairs of the Association are on a basis of steady progress, with no evidence of deterioration either in the short or the long view. . . . Last year, for the first time in many years, the Association incurred a small net loss on its operations. This deficit was not considered to be cause for concern. With the circumstances of reduced income from dues, absence of customary revenues from the technical exhibit of the annual meeting, the increased disbursements for ordinary purposes of the legislative year, it is surprising that the loss incurred was not greater. It is true that expenses have shown a gradual and a definite upward trend. . . . This should be expected in an organization which shows progress, development and expansion of activities. We should expect this increase to continue. Because of this tendency, most state medical associations have found it necessary to increase their dues, and an analysis of this feature in other state medical associations proves that few have a membership fee as modest as ours. We expect that the end of the war, the return of physicians to active practice, the resumption of the annual meeting and other factors will improve our financial position and enable the Association to make the justifiable additions to its reserve account which have been customary in prior years.

You have heard the recommendation made by the Chairman of the Council on behalf of the Council, which met yesterday. That recommendation was to the effect that the matter of incorporating the \$5.00 assessment as a permanent part of the dues of the Minne-

MINNESOTA STATE MEDICAL ASSOCIATION

sota State Medical Association should be acted upon. As you know, the \$5.00 assessment has been brought to the attention of the House of Delegates each year since the assessment was started; that is according to the original arrangement which requires the House of Delegates to approve that assessment on a yearly basis. We have asked that you approve that assessment for the present year. In considering that matter, I would like you to recall that the dues of all of the members who have been in the Armed Services will be remitted this year providing those members come back or are released from service during this year. In other words, any member of the Service who is released following the beginning of this year is not expected to pay dues; so that the increment from membership fees will not be aided materially or increased because the war is over until the expiration of this year.

The reports of the Chairman of the Council and the Chairman of the Finance Committee were accepted, following which the Speaker called for the reports of the reference committees.

Because of their brevity, the reports of the four following committees were accepted without comment: *Heart*, F. J. Hirschboeck, Duluth, Chairman; *Syphilis and Social Diseases*, P. A. O'Leary, Rochester, Chairman; *Vaccination and Immunization*, E. J. Huenekens, Minneapolis, Chairman; and *Conservation of Hearing*, L. R. Boies, Minneapolis, Chairman.

Dr. N. W. Barker, Rochester, Chairman of the *Reference Committee on Medical Education Reports*, called special attention to the report of the *Committee on First Aid and Red Cross*, of which Dr. J. S. Lundy, Rochester, is Chairman, commending the members for their work during the past year and especially their preparation of the sheet of recommendations concerning the uses of the various blood substitutes to be included with the packages of dried blood plasma being distributed to state physicians. The House of Delegates adopted the report of the *Committee on First Aid and Red Cross*.

The *Reference Committee* cited the excellence of the report from the *Committee on Medical Education and Hospitals* and the programs which it outlined for the postgraduate work of veteran medical officers. Dr. Barker called particular attention to the statement in the report concerning the plans of the University Medical School faculty to gradually decelerate while studying carefully the instructional program for the purpose of revision and improvement.

DR. BARKER: It is apparent that although there are some definite criticisms of the accelerated program which was adopted during the war, there are some lessons which have been learned which may be of value in the consideration of a limited acceleration over the pre-war curriculum. This is something I think we should be thinking about because the curriculum of the medical schools throughout the country has been extended over too long a period and with the present desire of most medical students and the necessity for post-graduate training, some consideration should be given and careful study made of the possibility for shortening the length of time of the regular undergraduate medical curriculum.

The *Reference Committee* also wants to call particular attention to the statements made in the report which concern the program for increasing hospital facilities, namely, that hospital facilities in many sections of the state are clearly inadequate, that much hospital building is planned for the next few years, but that even if the

matter of physical facilities is solved, there still will be the problem of sufficient nursing, technical and other personnel needed to carry on the operation of hospitals, and further, the communities will be cautioned not to embark upon programs for hospital care that will eventually become a burden to the community.

The report of the *Committee on Medical Education and Hospitals* was adopted.

Before proceeding to the report of the *Committee on Public Health Nursing*, Dr. Mario Fischer, Duluth, Chairman, Dr. Barker mentioned particularly the statement in the report recommending that the Minnesota State Medical Association reaffirm its approval of the basic principles behind the defeated 1945 Legislative Session Bills known as H.F. 34 and S.F. 31, and that it continue to give the state Organization for Public Health Nursing its assistance in securing the adoption of a comparable measure by the 1947 Minnesota Legislature.

DR. BARKER: The principles and purposes of this bill are to encourage large numbers of rural counties to provide public health nursing services for their respective jurisdictions, and to provide State aid and appropriate State money for such services. Now, whether or not you who know about this bill are in favor of the bill as it stood in detail, I think the House of Delegates should go on record as approving the basic principles behind the bill.

The House of Delegates accepted the recommendation of Dr. Barker and the report of the *Committee on Public Health Nursing*.

The next report to be taken up by the Delegates was that of Dr. A. H. Wells' *Committee on Cancer*, which received recognition from Dr. Barker and the *Reference Committee* for its splendid work during the past year in behalf of the control of cancer through the encouragement of early examination and diagnosis. Specifically cited for approval was the work of the *Committee* in laying plans for the setting up of free cancer detection centers throughout the state. These centers are to be established with the approval of the County Medical Society; it was voted by the House of Delegates that the report be adopted and that the County Medical Societies be urged to establish such cancer detection centers as soon as they become feasible.

An extensive report was submitted to the House of Delegates by the *Committee on Tuberculosis*, J. A. Myers, Minneapolis, Chairman, including plans for tuberculosis control outlined by the sub-committee. Discussed in the report was an Ideal Tuberculosis Case-Finding Program, which was recommended for publication in *MINNESOTA MEDICINE* (see page 804). The *Committee* members were congratulated for the excellence and thoroughness of their work throughout the year. The report of their activities was approved.

With the acceptance of the Tuberculosis *Committee* report, the report of the *Reference Committee on Medical Education Reports* was brought to a close.

The next order of business was the report of the *Reference Committee on Miscellaneous Scientific Reports*, of which Dr. C. G. Sheppard of Hutchinson was Chairman.

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The first report was that of the *Child Health Committee*, Dr. R. L. J. Kennedy, Rochester, Chairman, which called for the launching of a study of child health services in the state in co-operation with a national survey being conducted by the American Academy of Pediatrics. Dr. Kennedy was present and spoke to the Delegates concerning matters pertinent in the Child Health field. The Child Health report, advocating the publication of a leaflet on "Ringworm of the Scalp" for distribution to the public, the statewide survey of child health services and the preparation of a leaflet on rheumatic fever, was approved by the House of Delegates.

Reports of the following committees were adopted without comment: *Diabetes*, J. R. Meade, St. Paul, Chairman; *Fractures*, V. P. Hauser, St. Paul, Chairman; *Industrial Health*, A. E. Wilcox, Minneapolis, Chairman; *Interprofessional Relations*, W. P. Gardner, St. Paul, Chairman; *Medical Testimony*, E. M. Hammes, St. Paul, Chairman; *Maternal Health*, R. J. Moe, Duluth, Chairman; *Military Affairs*, R. H. Creighton, St. Paul, Chairman; and *Historical*, M. C. Piper, Rochester, Chairman.

Preceding the adoption of the report of the *Committee on Nervous and Mental Diseases*, Dr. W. P. Gardner, Chairman, some discussion was held in regard to the request in the report for support of the building program for the State Psychiatric Hospitals as outlined by the director of the Division of Public Institutions of the State of Minnesota. Dr. Sheppard suggested that the Minnesota State Medical Association go on record as favoring special units set aside from the State Hospitals for the care of the aged and also that the Association support the recommendation of the Committee to raise the standards of medical and nursing care in these institutions. Dr. Sheppard emphasized that part of the report which cited the deplorable situation in this State where the aged are institutionalized in State Hospitals for the Insane. The Delegates approved of the work of the Committee and the suggestions of Dr. Sheppard.

Approval was given to the members of the *Committee on Ophthalmology*, Dr. T. R. Fritsche, New Ulm, Chairman, for their interest in establishing an "Eye Bank" in Minnesota in the near future; and the report was accepted with the comment by Dr. Sheppard that it was the hope of the assembly that the Committee will be successful in the establishing of this Eye Bank.

The *Committee on Public Health Education*, of which Dr. S. H. Baxter, Minneapolis, is Chairman, received commendation for the splendid program it has carried out for the past year in preparing the Subject-of-the-Month packets, its distribution of vaccination and immunization leaflets and posters in co-operation with the State Department of Health, its sponsorship of exhibits on health matters for the Young Men's Christian Association and for the Minnesota State Dental Association's annual convention, and its carrying on of other activities concerned with keeping the public informed. Special recognition was given to Dr. William A. O'Brien for his excellent series of radio talks on health, which have been continued without interruption for eighteen

years. Further mention was made of Dr. O'Brien's radio work in the report of the *Radio Committee*. The reports of the *Committee on Public Health Education* and the *Radio Committee*, of which Dr. R. M. Burns, St. Paul, is Chairman, were accepted, concluding the report of the *Reference Committee on Miscellaneous Scientific Reports*.

The next order of business was the reports of the *Officers and Councilors*. Speaker Coventry called upon Dr. J. R. Aurelius, St. Paul, to present these reports.

Dr. Aurelius said that his committee had considered the reports of the Officers and Councilors carefully and had found them to be complete. These reports were taken up as follows and adopted by the Delegates:

Secretary and Executive Secretary—B. B. Souster, M.D., St. Paul, and R. R. Rosell, Minneapolis

Treasurer—W. H. Condit, M.D., Minneapolis

Chairman of the Council—F. J. Elias, M. D., Duluth

Councilors:

First District—L. A. Buie, M.D., Rochester

Second District—L. L. Sogge, M. D., Windom

Third District—C. M. Johnson, M.D., Dawson

Fourth District—A. E. Sohmer, M.D., Mankato

Fifth District—E. M. Hammes, M.D., St. Paul

Sixth District—A. E. Cardle, M.D., Minneapolis

Seventh District—W. W. Will, M.D., Bertha

Eighth District—W. L. Burnap, M.D., Fergus Falls

Ninth District—F. J. Elias, M.D., Duluth

The Speaker then asked for the report of Dr. N. H. Baker, Fergus Falls, Chairman of the *Reference Committee on Medical Economics Reports*. The reports of the following committees in this group were accepted:

Medical Ethics—R. D. Mussey, M.D., Rochester, Chairman

Low Income and Indigent Problems—W. A. Coventry, M.D., Duluth, Chairman

Industrial and Contract Practice—R. F. McGandy, M.D., Minneapolis, Chairman

Editing and Publishing—E. M. Hammes, M.D., St. Paul, Chairman

Medical Advisory—W. H. Hengstler, M.D., St. Paul, Chairman

Public Policy—L. L. Sogge, M.D., Windom, Chairman

State Health Relations—T. H. Sweetser, M.D., Minneapolis, Chairman

Medical Economics—George Earl, M.D., St. Paul, Chairman

Medical Service—A. W. Adson, M.D., Rochester, Chairman

University Relations—E. L. Tuohy, M.D., Duluth, Chairman

Dr. O. J. Campbell of Minneapolis was called upon next for the report of the *Reference Committee on Miscellaneous Medical Economics Reports*. The first to be taken up was the report of the *Committee on Rural Medical Service*, of which Dr. B. J. Branton, Willmar, is Chairman. This committee was created in September, 1945, by action of the Council following the appointment of a similar committee by the Board of Trustees of the American Medical Association, for the purpose of co-operating with farm groups in the exploration and

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solution of rural health problems that exist in many areas today. The report of this committee, covering its activities in preparing the way for action in improving health conditions in rural Minnesota, was adopted by the House of Delegates.

Some discussion was carried on with regard to the importance of the proposed fee schedule and contract which the Minnesota State Medical Association and the Veterans Administration, which was the subject of the report of the *Medical Advisory Committee on Veterans Affairs*, Dr. R. H. Creighton, Minneapolis, Chairman. This committee is also of relatively recent origin, having been formed early in 1946 at the request of General Hawley, Medical Director of the Veterans Administration, who asked that state associations assume the responsibility for working out programs for veterans out-patients care in their respective states. The work of the committee in devising a schedule of fees which would be fair to all concerned and in arranging a contract which would provide the best medical care to returned veterans with service-connected disabilities, as outlined in the report, was approved by the Delegates.

In presenting the report of Dr. Branton's *Committee on Organization for Prepaid Medical Service*, created last year under the terms of the Enabling Act, Dr. Campbell spoke highly of the effort to shape up a workable plan for Minnesota made by the members. "Your Reference Committee pays the highest tribute to the work of this committee," he said. "Perhaps no undertaking of the state organization ever has demanded so much of a committee."

The House of Delegates voted to approve the method proposed by the Committee for the establishment at an early date of a voluntary prepaid medical service plan for Minnesota. With the acceptance of the report of the *Committee on Organization for Prepaid Medical Service*, the Committee reports were brought to a close.

A recommendation that a resolution be prepared commending Mr. Oscar C. Pierson and Dr. Orianna McDaniel, both of whom are retiring, for their long service to the State Board of Health was referred to the *Committee on Resolutions*. A proposed amendment to the Constitution and By-laws providing life memberships for physicians in the Association for forty years and having reached the age of seventy was referred to the Council. Resolutions regarding phases of the Emergency Maternal and Infant Care Program were referred to the *Resolutions Committee*.

The meeting was adjourned at 12:15.

Second Meeting, Sunday, May 19, 1946
Continental Room, Hotel Saint Paul
Saint Paul, Minnesota

The second session of the House of Delegates was convened at 3:15 p.m. with the first item of business a report from Dr. A. W. Adson of Rochester on a meeting of the *Council on Medical Service of the American Medical Association*, held to review certain Washington activities of concern to the medical profession.

Among the recent developments discussed by Dr. Adson was the action of the President when he removed the Children's Bureau from the Department of Labor

and put it under the Federal Security Agency and when he abolished the social security board.

Dr. Adson reported on the status of a number of bills in Congress, among which were the Wagner-Murray-Dingell bill for the federalization of medicine, the Pepper bill to extend the EMIC program, the Hill-Burton Hospital Construction Bill and the Kilgore-Magnuson Educational and Research bill.

He said that the Washington observer for the AMA reports there is sufficient opposition to the Wagner-Murray-Dingell bill to cause it to be looked upon unfavorably. The bill which Senator Taft introduced, has not been endorsed by the AMA, although it does have some desirable features, such as providing for the centralization of all government-sponsored activities in the medical field, but it contains other provisions with which the profession cannot agree.

Dr. Adson also reported on the progress of prepayment medical plans throughout the country. According to latest figures at the time of Dr. Adson's report, 33 states had developed and were using some form of prepaid medical care, 29 of these with plans in actual operation and four with plans ready to go. Minnesota comes in the latter group. Eighteen different plans were represented in the 33 states, most plans employing physician sponsorship. The present goal of the Council, Dr. Adson said, is to encourage every state to participate in the program for development of voluntary prepaid medical service.

Speaker Coventry next called on Dr. W. F. Braasch of Rochester who endorsed the information presented by Dr. Adson. He said that the AMA Board of Trustees has been working with the Council on Medical Service and thoroughly approves of its actions. Both organizations have met together frequently in the exchange of ideas and together with the House of Delegates are looking forward to the increased development of prepayment plans according to the ideals of the Council and the Board of Trustees.

Dr. Braasch reported on *Minnesota Procurement and Assignment services*, which were officially terminated on May 1. He said that during the war, a total of 1,638 physicians were in the medical corps of the armed services, and to date it was reported that from 700 to 1,000 men had been released, leaving 700 to 800 not yet returned to private practice in the state; included in this are many interns, residents and fellows in the various hospitals in the state, in the University and at the Mayo Clinic.

The office of Procurement and Assignment, Dr. Braasch said, has been used, in conjunction with the other services at the state headquarters, in giving information to veterans in regard to opportunities in various communities of the state. A survey of the state was made as to the status of medical practice and opportunities. Information of this kind was obtained from many other state associations by the AMA and was made available to returning servicemen and has been of great assistance to them.

Dr. Braasch then reviewed the work of the Committee on National Emergency Medical Service, created by the AMA to study the problems of administering the medical corps of the armed services.

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Speaker Coventry announced that a copy of this report was to be placed in the files and a copy was to go to the State Military Affairs Committee. He then asked Dr. F. J. Hirschboeck of Duluth for the report of the *Resolutions Committee*.

A resolution was presented and passed commending and thanking the following organizations and groups:

The officers and members of the Minnesota State Medical Association

The officers and members of the Ramsey County Medical Society

The Local Arrangements Committee of the Ramsey County Society

The Management of the Hotel Saint Paul

Radio Stations WCCO, WTCN and KSTP

The Minneapolis *Star-Journal and Tribune*, the Duluth *News-Tribune*, The St. Paul *Dispatch and Pioneer Press* and the Rochester *Post-Bulletin*.

A resolution commending and thanking Dr. William A. O'Brien for his splendid talks on health matters and to Stations WCCO, KUOM, KROC and KFAM for their public spirit in making time available gratuitously for these programs was adopted.

A resolution was passed expressing deep regret by the members of the Association at the resignation of Dr. Olin West as Secretary and General Manager of the AMA and directing the Secretary to transmit an expression of appreciation to him for his unselfish and devoted service on behalf of the membership of the Minnesota State Medical Association.

A resolution was passed extending the thanks and appreciation of the Association to Dr. Buie, the members of the *Finance Committee* and their advisors for painstaking and efficient work.

It was resolved that the House of Delegates express for the Association its sincere appreciation to Dr. Orianna McDaniel and to Mr. Oscar C. Pierson upon their retirement from the State Board of Health.

A resolution was passed directing that the Medical School of the University of Minnesota be respectfully petitioned to establish and provide combined residencies in ear, eye, nose and throat to meet existing needs in rural areas of the state for men with such combined training.

Following these resolutions, the meeting was adjourned at 4 p.m.

Third Meeting, Sunday, May 19, 1946 Continental Room, Hotel Saint Paul Saint Paul, Minnesota

The meeting was convened at 8:15 p.m., Dr. Coventry presiding.

The first order of business was a report of the *Division of Social Welfare of the Minnesota Social Security Department*, read by Dr. E. M. Jones of St. Paul, in the absence of Mr. Jarle Leirfallom.

Mr. Leirfallom's report stated that the Division appreciates tremendously the fine relationships which it has had with the medical practitioners of this state, and that it is particularly appreciative of the work done by the Association President, Dr. Simons, who is both a champion of American medicine and a firm believer in modern social welfare methods and technics.

The report outlined the old age assistance medical program which has been carried on more successfully since the Legislature removed the \$40 maximum for medical care. Another matter discussed was the recent direct attempt of a federal agency to encroach upon private practice of medicine in Minnesota, through the installation of procedures and policies which are questionable in the opinion of the Social Welfare Division.

It was further reported that the program of the Division is still being operated so far as possible on the basis of maintaining local initiative and responsibility and not imposing state domination on local communities any further than is necessary.

Next Dr. Coventry called for the report of the *Minnesota State Board of Examiners in the Basic Sciences* from Raymond N. Bieter, Secretary-Treasurer.

Dr. Bieter reported that during the past year, three examinations have been given by the Board with 230 individuals passing the examinations and thirty-seven failing, making a total of 267 persons examined. The report was accepted by the Delegates, after which the report of Mr. Ray Amberg on the progress of the Minnesota Hospital Survey was given.

Mr. Amberg reviewed the purpose of the survey, which is being conducted by a committee set up at the request of the State Medical Association and the State Hospital Association through Governor Thye. He said that the principal concern of the committee is to find out what we have in Minnesota. Dr. Viktor O. Wilson has been appointed chairman of the *Survey Committee* and plans are to hold regional meetings later on. It is proposed to go into the social and economic factors that are present in the state areas to get an answer to the state needs, thus eliminating the need for federal control.

Dr. A. J. Chesley, St. Paul, was then asked by the Speaker to present his report on the activities of the *State Board of Health*. He added further to Mr. Amberg's remarks, stating that the hospital survey, which is closely allied with the hospital licensing carried on by the Board of Health, was to get underway May 7. He also summarized the program of the distribution of surplus blood plasma, the sanitation work, and the work done by the *State Board of Health* under the EMIC program.

Dr. J. F. Du Bois, Sauk Center, was called upon by the Speaker for his report on the *Minnesota State Board of Medical Examiners*. He brought up several problems, and presented a statistical summary of the year's activities of the board. Following this report Dr. Shepard brought up several recommendations which had been referred at the previous meeting to his *Resolutions Committee*.

The first matter to be discussed was that of the EMIC program and the future of the Consultants Directory ("Blue Book"). A joint meeting of the *Reference Committee on Miscellaneous Scientific Reports*, the *Resolutions Committee* and the *State Advisory Committee* on the EMIC Program was held to study the background of the EMIC program and a set of recommendations were drawn up. It was the conclusion of this Study Committee that because of the fact that the EMIC pro-

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gram is self-limiting, due to expire in the near future, it would be well for the members of the medical profession in this state to do the best they can under the present setup. The Committee recommended that copies of the report be made available to the membership. The report of the Study Committee was accepted.

Dr. Sheppard read a resolution recommending that the practice of listing special societies, in place of conventional hospital staff lists, be abolished, whereupon the resolution was referred to the *Resolutions Committee* to be reported on at the following session of the House of Delegates.

A resolution was presented for the appointment of a committee of Drs. Frank E. Burch, St. Paul, William Benedict, Rochester, Erling Hansen, Minneapolis, and Frank Knapp, Duluth, to investigate the possibilities of a Minnesota "Eye Bank," in accordance with the report of the *Committee on Ophthalmology*. This matter was referred to the *Committee on Miscellaneous Scientific Reports*.

Dr. F. W. Lynch, St. Paul, then presented the *Necrology Report*. The House of Delegates rose in silent tribute to the memory of the departed members and former members.

The meeting was adjourned at 10 p. m.

Fourth Meeting, Monday, May 20, 1946 Terrace Cafe, Hotel Lowry Saint Paul, Minnesota

The House of Delegates convened for its final session at 1:20 p. m., Dr. Coventry presiding. Upon receiving the report of the *Credentials Committee* that there was a quorum present, the Delegates proceeded to the report of the *Resolutions Committee*, made by Dr. Hirschboeck.

The resolution recommending the discontinuation of the posting of certain classifications in hospitals of the State of special societies was recommended for transfer to the *Committee on Ethics* for further investigation. However, it was decided to turn the matter over to the Council.

The resolution to abolish the Directory of Consultants of the EMIC program was tabled by the Delegates in view of previous action which negated some of the considerations advanced in the resolution.

The next order of business was the election of officers of the Minnesota State Medical Association, and the following officers were elected unanimously:

President-elect: Louis A. Buie, Rochester
First Vice President: Carl B. Drake, St. Paul
Second Vice President: L. R. Gowan, Duluth
Secretary: B. B. Souster, St. Paul (re-elected)
Treasurer: William Condit, Minneapolis (re-elected)
Speaker of the House: William A. Coventry, Duluth (re-elected)
Vice Speaker: C. G. Sheppard, Hutchinson
Councilor, First District (to fill the unexpired term of Dr. Buie): R. L. J. Kennedy, Rochester
Councilor, Third District: C. M. Johnson, Dawson (re-elected)
Councilor, Fifth District: E. M. Hammes, St. Paul (re-elected)

Councilor, Seventh District: W. W. Will, Bertha (re-elected)

Delegates to the American Medical Association: A. W. Adson, Rochester, (re-elected) and W. A. Coventry, Duluth (re-elected)

Alternates: W. L. Burnap, Fergus Falls, (re-elected) and J. C. Hultkrans, Minneapolis (re-elected)

It was then moved, seconded and carried that the invitation extended by Dr. L. A. Barney, acting for the St. Louis County Medical Society, to hold the 1947 meeting in Duluth be accepted.

Speaker Coventry called on Dr. Elias for a report of the Council proceedings. Dr. Elias stated that affiliate membership for Dr. John Crewe of Rochester had been approved by the Council. Dr. Elias read the following amendment to the By-laws of the Association, which the Council recommended for adoption:

"Any person who has been an active member of this Association for 40 years and has reached the age of seventy years is eligible for Life Membership. Such person may apply for such membership through his component Society, to the Council of the Association, and, upon favorable action by the Council, become a Life Member, enjoying all the rights and privileges of Active Membership, but exempt from the payment of dues to the State Association. Life Membership in this Association is subject to all the conditions of Active Membership. The privilege of receiving MINNESOTA MEDICINE shall be extended to Life Members upon payment of the regular subscription price."

The adoption of this amendment was moved, seconded and carried.

Dr. Elias reported that the Council formally adopted a motion that the report of the discussion and recommendations relative to the EMIC program in Minnesota made by the special Study Committee be sent to the entire membership along with a short letter calling attention to the importance of the report. It was also agreed upon by the Council that the report be edited for MINNESOTA MEDICINE and that Dr. Simons give it space in the President's Letter.

Some discussion was then held by the Delegates following Dr. Elias' report of Council action with regard to a Prepaid Medical Service Plan for Minnesota. This was followed by a motion that a letter to the House of Delegates on matters pertaining to the Minnesota Medical Service Plan together with the Contract and the Pledge, be sent out from the State Office. This was seconded and carried.

At 3:20 p. m. the Ninety-third Annual Meeting of the House of Delegates was adjourned.

SPECIAL FEATURES

At the annual banquet of the Minnesota State Medical Association, held in the Continental Room of Hotel Saint Paul, Tuesday evening, May 21, special recognition was given to several Minnesota physicians.

Admitted to the *Fifty Club*, in recognition of their fifty years of membership in and service to the Minnesota State Medical Association were the following nine doctors: Charles Bolsta, Ortonville; Leonard E. Claydon, Red Wing; Charles Geromo, Balaton; Charles D.

Harrington, Wayzata; Aaron E. Henslin, Le Roy; Edgar A. Khng, Minneapolis; George P. Kirk, East Grand Forks; M. Keller Knauff, St. Paul; and Edward E. Novak, New Prague.

The *Southern Minnesota Medical Association Medal*, awarded each year to the individual physician who presents the most outstanding scientific exhibit at the meeting, was awarded this year to Dr. Kano Ikeda of the Charles T. Miller Hospital, St. Paul, for his exhibit, "Routine Color Photography." Honorable mention was made of the work of Drs. Theodore E. Bratrud and W. H. Thompson, University of Minnesota departments of pathology and pediatrics, for their study, "Hyperfunction of the Adrenal Cortex"; Drs. T. J. Kinsella, Minneapolis, and E. R. Crow, Minnesota State Sanatorium, Ah-Gwah-Ching, for their exhibit, "Extrapleural Pneumothorax and Oleothorax," and Dr. E. Gellhorn, University laboratory of neurophysiology, for his exhibit "Experimental and Clinical Epilepsy." Judges of the scientific exhibits were Drs. Louis A. Buie, Rochester; William A. O'Brien, Minneapolis, and J. W. Prentice, Ashland, Wis.

In appreciation of his many years of service to the profession and to the Association, Dr. William A. Coventry of Duluth, former President of the Minnesota State Medical Association and present Speaker of the House of Delegates, was presented with the *1946 Distinguished Service Medal and Citation*.

Presentation of Distinguished Service Medal to Dr. W. A. Coventry

DR. SIMONS: I deem it a great privilege, as President of the Minnesota State Medical Association, to honor one of our most active and distinguished members this evening. I say distinguished because he has served our Association long and well—as a former president, as committee chairman, as member of the Council, as delegate to the American Medical Association and now, as Speaker of our House of Delegates.

In civic and fraternal affairs, too, he has held many positions of leadership with distinction. We mention only a few here: The Duluth Chamber of Commerce, of which he held the office of president; the Minnesota Arrowhead Association, of which he is past president; the Kiwanis Club, where he served as governor and president; and the Shrine of which he was Potentate.

A prominent surgeon of Duluth, he was an organizer of the Duluth Clinic and is today the head of its Surgery Division. A fellow of the College of Surgeons, his affiliation with other societies relating to his profession are numerous. Among these are the St. Louis County Medical Society, the Minnesota State Association of Obstetrics and Gynecology; the Central Association of Obstetrics and Gynecology; the American Association of Obstetrics and Gynecology and Abdominal Surgery; the American Board of Surgery; the Western Surgical Society; the Minnesota Surgical Society, and the Duluth Surgical Society.

For his devoted and illustrious contribution to scientific medicine, for his untiring service in behalf of organized medicine, for his outstanding contribution to civic betterment, the Council of the Minnesota State Medical Association awards its distinguished service medal for 1946 to Dr. William A. Coventry of Duluth. It is an honor and a great pleasure for me to confer upon him at this time this citation which I hold in my hand, together with this distinguished service medal of which Dr. Coventry is so richly deserving.

AUGUST, 1946

In Memoriam

JOSEPH M. HALL

Dr. Joseph M. Hall, a practicing physician in Minneapolis for thirty-two years, died July 19, 1946, of heart disease which had forced his retirement from practice six months previously.

He was born in Minneapolis December 18, 1887, and attended North High School. He obtained his medical degree from the University of Minnesota Medical School in 1913 and interned at Minneapolis General Hospital.

Dr. Hall was a member of the Hennepin County Medical Society, and the Minnesota State and American Medical Associations. He was a member of the staff of Asbury Hospital.

He is survived by his wife, his mother, Mrs. Mary Alice Hall, Minneapolis, and his son, Allan M. Hall, New York.

NELS ANDREW GUNDERSON

Dr. Nels Andrew Gunderson, Minneapolis, died July 17, 1946, following a heart attack.

He was born March 24, 1896, in Wisconsin. He was graduated from the University of Minnesota Medical School in 1921 and became a member of the Hennepin County Medical Society and the Minnesota State and American Medical Associations. He was also a member of the Scottish Rite and at one time was chief of staff of the Swedish Hospital.

Dr. Gunderson is survived by his wife and three sons: Ensign Nels Andrew, III, Jerome David, recently discharged from service, and Don Howard.

DANIEL CAMERON LOCHHEAD

Dr. D. C. Lochhead of Rochester, Minnesota, died March 14, 1946. He was born January 19, 1878, at Almonte, Ontario. He received his medical education at Trinity Medical School and at Toronto Medical School, obtaining his M.D. degree in 1905. He practiced in North Dakota from 1906 to 1910 and at Saskatchewan from 1910 to 1921, when he moved to Rochester.

Dr. Lochhead obtained a degree in Public Health from the Toronto Medical School in 1915 and was Deputy Health Officer of Rochester for many years. In 1928 he was elected Honorary Member of the Olmsted County Medical Society.

POLIOMYELITIS

(Continued from Page 770)

44. Ward, R., and Sabin, A. B.: Presence of poliomyelitis virus in human cases and carriers during winter. *Yale J. Biol. & Med.*, 16:451, 1943-44.
45. Weaver, H. M.: Resistance of cotton rats to the virus of poliomyelitis, as affected by intake of vitamin B complex, partial inanition and sex. *Am. J. Dis. Child.*, 69:26, 1945.
46. Weaver, H. M. et al.: Acute anterior poliomyelitis during pregnancy. *Am. J. Obst. & Gyn.*, 47: 495 (April) 1944.
47. Zinsser and Bayne-Jones: *Poliomyelitis*. Textbook of Bacteriology, 8th edition.

Minneapolis Surgical Society

Stated Meeting Held March 7, 1946

The President, Robert F. McGandy, M.D., in the chair

OBSTRUCTIVE JAUNDICE

Report of Case

E. G. BENJAMIN, M.D.
Minneapolis, Minnesota

This report is that of a housewife, sixty-four years of age.

Complaint on admission: weakness over a period of two years; jaundice for two years; dryness of the skin and itching; loss of 40 pounds in weight during the past year. Present illness: The patient's main complaint has been weakness. At first she weighed around 160 pounds, but in a year's time her weight dropped to 118, which weight she has held for about a year. The patient states that one of the first things she noted was the yellowish color of her eyes and skin. This jaundice has persisted ever since with varying intensity. The jaundice was accompanied by marked dryness of the skin and mucous membranes and marked itching. It was not accompanied by any pain. She has been quite constipated for the last three to four weeks, and stools have been clay colored. She states that until the present illness she had never been sick.

The following letter was received from her previous doctor relative to an examination that was done elsewhere: "Mrs. H. was first examined on July 29, 1937, when she came complaining of painless jaundice which she had had since December, 1936, and which had been diminishing since March, 1937. On examination, the liver was palpable but there were no tenderness, firmness, or definite nodules present. The urinalysis was negative. The hemoglobin, blood count and blood flocculation tests for syphilis were normal. There was no anemia. The differential blood count was normal. Gastric analysis showed the gastric acids to be normal. Roentgenograms of the stomach and chest were negative. Roentgenologic study of the gall bladder showed a poorly functioning organ with a suggestive primary shadow of a pathologic gall bladder. The serum bilirubin on admission was 2 mg. and the van den Bergh reaction was direct. A liver function test showed a dye retention, grade 4.

"It was thought that there was a possibility that the gall bladder was palpable here and felt the condition might well be surgical. As Mrs. H. appeared to be gaining at the time, it seemed well, however, to go along with close observation on a medical regime.

"She returned a month later and had made very definite improvement in the interim. Her jaundice seemed to be clearing slightly although the serum bilirubin

was 1.8 mg. with a direct reaction, which showed no significant change. Under the circumstances, as the dye retention test persisted at a retention of grade 4, it seemed best to continue a medical regime with observation, and accordingly she was advised to continue on a high-carbohydrate, low-protein, high caloric diet with Haliver oil and various general measures in an attempt to improve her condition.

"It was suggested that she return for observation in about six weeks but she did not return except after a lapse of thirteen months when she came in on October 24, 1938. At this time, the liver was palpable across the upper abdomen and down about four fingers breadth on the right. It was firm but not nodular. She was quite markedly jaundiced. The serum bilirubin showed a direct van den Bergh reaction and was 14.7 mg. per cent. The urinalysis showed a moderate amount of albumin, a slight reduction in Benedict's solution and a large amount of bile. The hemoglobin was 12.9 grams with 3,620,000 erythrocytes and 11,500 leukocytes. Fluoroscopic examination of the esophagus failed to show the presence of varices. The spleen could not be palpated.

"It was felt that it was probably a primary liver disease which was in the nature of a biliary cirrhosis and that there was nothing to accomplish by exploration. The prognosis is not too good at this time and I see nothing to suggest in the way of therapy other than the high carbohydrate diet."

Inventory by Systems: Head and neck: wears glasses for reading; no history of vertigo; no impairment of hearing; no complaint of ears or throat. Cardiorespiratory: no shortness of breath or exhaustion; no dyspnea, cyanosis or palpitation. Gastro-intestinal: Up until present complaint, history has been essentially negative. She has been very jaundiced, with constipation and clay colored stools. She has been nauseated only once with a small emesis. Genito-urinary: no frequency, burning or pain. Gynecological: post-menopause, no symptoms. Extremities: there has been a dryness of the skin accompanied by itching.

Past History: The patient has had the usual childhood diseases and diphtheria. She has had no previous operations, and up until the present illness has been in good health.

Family History: Her father and mother are both dead. She has one brother and one sister alive and well. One sister died in childbirth. She has three children of her own living and well; one died of pneumonia.

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Physical Examination: The patient is a rather emaciated white woman, weighing 118 pounds. The sclerae are yellow, but the eyes react to light and accommodation. Pupils are round and equal. The ears and nose are negative. The throat is somewhat reddened and granular. The tonsils are enlarged. She wears complete dentures. There is marked adenopathy present in the right submaxillary region. The chest is symmetrical and has good expansion. The breath sounds are normal. No râles. The heart sounds are normal, no murmurs. Blood pressure 150/80. The abdomen reveals the liver palpable about three to four fingers below the costal margins. There is no tenderness or rigidity. The skin is very wrinkled and quite brown, and very dry. Pigmentation is fairly regular. The brown color is rather queer and hard to describe, but gives one the impression of being of hematogenous origin. The pelvis is normal. The extremities show some pitting.

Laboratory: Urine sp. gr. 1.009, trace of albumen, no sugar, alkaline, slightly cloudy, straw colored. Microscopic: negative. Blood: Hgb. 74 per cent; red cells 3,860,000; white count 8,400, small and large lymphocytes 29 per cent, mononuclears 4 per cent, transitional 0.5 per cent, neutrophils 65 per cent (5 bands), eosinophiles 1.5 per cent; bleeding time 3 minutes; clotting time 5 minutes 15 seconds. Color index: 0.9 plus; icterus index (11/7/38)—55; icterus index (11/12/38)—16. Van den Bergh: direct reaction—normal; indirect—positive. Kline and Wassermann negative. Gastric analysis negative.

Pre-operative Diagnosis: Possible biliary cirrhosis: jaundice, loss of weight, general weakness, previous examination elsewhere revealed pathological gall bladder which functioned poorly.

Detailed description of operative technic and operative findings: Under gas-ether anesthesia, a high right rectus incision was made. The peritoneum was opened and the contents of the abdomen explored. The liver was found to be slightly increased in size, had a very hard surface, was grayish in color, the typical picture of cirrhotic hepatitis. A small fibroid of the uterus was present. There were a great many firm fibrous adhesions around the gall bladder and ducts. The gall bladder was exposed with some difficulty. A large stone about 2 cm. was palpated in the region of the juncture of the cystic and common ducts. It was thought there was some impingement on the common duct due to pressure from the stone. During the process of freeing the adhesions around the gall bladder, the gall-bladder wall was torn at the fundus and there was drainage of clear, straw-colored bile. The patient's general condition became critical, so no further surgery was attempted. The stone was removed without any difficulty through the opening in the fundus and a large rubber tube was sutured into the fundus. One large Penrose drain was left in the gall-bladder area.

After the immediate effects of the operation, the patient's general condition improved very rapidly, the

bile drainage became profuse, on the sixth postoperative day it was 800 c.c., on the eighth day 1,100 c.c., on the tenth day 1,175 c.c. and on the eleventh day it was 1,400 c.c. The stools at this time were clay colored.

On the twelfth postoperative day the tube was accidentally pulled out of the gall bladder and from that time on there was no more external bile drainage. Bile salts were given by mouth and the stools from this time on became greenish to brown.

She was out of bed on the eleventh postoperative day and discharged from the hospital on the twenty-first day. Her weight on date of discharge was 109 pounds. One month following her discharge, the patient reported that she was gaining strength very rapidly, the jaundice was clearing up, the itching of the skin was gone, the appetite was good, and the patient seemed quite well. Her weight then was 124 pounds, stools were normal. Three months after discharge she had no special complaint, her strength was good and weight 140 pounds, and recovery seemed to be almost complete.

Final Diagnosis: Cholelithiasis with associated jaundice (obstructive) and biliary cirrhosis.

CHOLECYSTECTOMY

An Analysis of 250 Consecutive Operations

ORLANDO P. JOHANN, M.D.*

Minneapolis, Minn.

The mortality and complications accompanying surgical operations have been reduced but not entirely eliminated despite the great progress which has been made in the field of surgery during the recent years. Among the factors which are responsible for the lowered incidence of complications and deaths, are the advent of chemotherapy and its application to various fields of surgery, careful pre-operative preparation, improved anesthesia, meticulous surgical technique, and individualized postoperative care.

An analysis was made of 250 consecutive cholecystectomies which were performed at Asbury Hospital in Minneapolis from January 1, 1942, to October 31, 1945, by a group of twenty-five doctors. During this period, a total of 14,425 operations, of all kinds, was performed in the Asbury Hospital. Nine of the group of twenty-five doctors in this series are members of the Minneapolis Surgical Society, and they performed 193 of the 250 cases, or 78.4 per cent of the total number of cholecystectomies. Three of the members of the Minneapolis Surgical Society did 142 of the cholecystectomies, or 57 per cent of the total number. The age of the patient, sex, postoperative hospital stay and the type of anesthesia will be considered in this analysis with special reference to the complications and mortality. All operations on the gall bladder and duct system in which a cholecystectomy was performed are included in this analysis.

*Resident in Surgery, Asbury Hospital, Minneapolis, Minnesota.

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TABLE I

Age Group	No. of Patients	Percentage
10-20	1	0.4%
20-30	25	10.0%
30-40	54	21.6%
40-50	63	25.2%
50-60	76	30.4%
60-70	29	11.6%
70-80	2	0.8%
Totals	250	100.0%

Cholecystectomy without any other additional operation occurred in only 113 of the cases. There were ninety-three cases in which a cholecystectomy plus an appendectomy were performed or an incidence of 37.2 per cent for routine appendectomies during gall-bladder surgery. Abdominal operations other than appendectomies, such as a gastric resection, hysterectomies, et cetera, occurred in nine cases. In thirty-five cases, or 14 per cent of the total number of cases, a choledochostomy was performed in addition to the cholecystectomy. The indications for the cholecystectomies were acute or chronic cholecystitis with or without cholelithiasis and carcinoma of the gall bladder. Cholelithiasis was encountered in 230 of the 250 cases; a non-functioning gall bladder with symptoms occurred in nineteen cases; and carcinoma of the gall bladder was the indication for one cholecystectomy.

Acute and chronic cholecystitis with or without cholelithiasis is of course principally a disease of middle age; the average age of the patients in this series was forty-six years. The largest number of cholecystectomies, seventy-six cases or 30.4 per cent, was performed on patients in the sixth decade. Patients in the fifth and fourth decades closely followed the sixth decade in the number of cholecystectomies, being respectively sixty-three and fifty-four cases. At the two extreme ends of life, the number of patients who underwent surgical treatment for cholecystitis gradually decreased, as shown in Table I. The youngest patient in this series was nineteen years of age and the oldest seventy-four.

As we know, gall-bladder diseases definitely predominate in the female. 206 of the 250 cholecystectomies, or 82.4 per cent, were performed on females as compared to only forty-four cases, or 17.6 per cent on males. The ratio of females to males in this consecutive series of cases was approximately 5 to 1.

The average postoperative hospital stay for the 250 cholecystectomies was 14.8 days. The length of the postoperative hospitalization was, of course, reduced in those who had no complications, the average being 13.5 days. It is surprising to observe that in the cases in which complications followed operation the average postoperative hospital period more than doubled that of those without complications. The average postoperative hospitalization in this undesirable group was 28.3 days. The longest postoperative period was sixty-nine days, and this occurred in a patient who developed pneumonia

TABLE II. POSTOPERATIVE HOSPITAL STAY
—DAYS

Non-complicated cholecystectomies	13.5
Cholecystectomies with complications	28.3
Average for the 250 cases	14.8

TABLE III

Type of anesthesia	No. of Cases
Spinal	64
Nitrous oxide and ether	27
Ethylene and ether	29
Cyclopropane	29
Cyclopropane and sod. pentothal	24
Spinal and local	15
Local and ethylene	8
Local and cyclopropane	7
Local and ethylene and ether	7
Spinal and cyclopropane	6
Ethylene,	6
Cyclopropane and ethylene	4
Spinal and nitrous oxide	4
Local	3
Spinal and ethylene	2
Local, nitrous oxide and ether	2
Local and sod. Pentothal	2
Various combinations of two or more anesthetic agents	11
Total	250

and subsequent lung necrosis following a pulmonary embolism. Subdiaphragmatic abscess prolonged the postoperative stay to sixty-five days in another patient, although both of the above patients eventually recovered.

A variety of twenty-eight anesthetic agents and combinations of agents was employed in this series of 250 consecutive cholecystectomies. Spinal anesthesia alone and in combination with other agents was used in ninety-six patients, or in 38.5 per cent of the total number of operations. Local anesthesia alone or used with other anesthetic agents was employed in forty-nine of the cholecystectomies, or in approximately 20 per cent of the total number of cases in this series. The popularity of ether anesthesia, either in combination with ethylene or nitrous oxide, which was used in many of the early cholecystectomies in this series has been largely replaced in recent cases by the use of sodium pentothal and cyclopropane combined with curare.

There was a total of twenty-nine complications or an incidence of 11.6 per cent in this series of 250 consecutive cholecystectomies. The percentage of serious complications was relatively low since wound infections, seven cases, accounted for 24.2 per cent of the total number of complications. Ten out of the twenty-nine com-

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TABLE IV. COMPLICATIONS FOLLOWING 250 CONSECUTIVE CHOLECYSTECTOMIES

Complications	No.	Re-covered	Died
1. Wound infection	7	7	0
2. Pneumonia	4	3	1
3. Pulmonary embolism	2	2	0
4. Subdiaphragmatic abscess	2	2	0
5. Paralytic ileus	2	1	1
6. Pleurisy	2	2	0
7. Wound disruption (not evisceration)	2	2	0
8. Biliary fistula	1	1	0
9. Ligation of common duct	1	1	0
10. Post-op. common duct obstruction	1	1	0
11. Hydrothorax	1	1	0
12. Atelectasis	1	1	0
13. Spinal headache	1	1	0
14. Septicemia	1	0	1
15. Coronary thrombosis	1	0	1
Totals	20	25	4

plications or approximately 35 per cent, were pulmonary in nature, four of which were pneumonias. The incidence of pulmonary embolism in this series was unusually low; only two cases were recorded and both were non-fatal. One of the patients had an uneventful fourteen-day postoperative course following pulmonary infarct. The second case of pulmonary embolism which occurred in a seventy-two-year-old male was followed by more serious sequelae as compared to the above cases, namely, atelectasis and pneumonia and later lung necrosis. When the latter patient was discharged on the sixty-ninth postoperative day, marked thickening of the pleura with considerable fibroid infiltration persisted in the region of the pulmonary infarction.

Two cases of paralytic ileus were listed as complications, one of which was fatal on the sixth postoperative day. The second case of severe paralytic ileus was successfully treated with prostigmine, acetyl choline, nasal syphonage and a Miller-Abbott tube.

There were two cases of subdiaphragmatic abscesses in this series of 250 consecutive cholecystectomies. In one of the cases, needle aspiration of the subdiaphragmatic region yielded only 8 c.c. of purulent material. The abscess gradually disappeared without surgical intervention, but the postoperative hospitalization was prolonged to sixty-five days. The septic temperature in the second case of subdiaphragmatic abscess promptly and dramatically returned to normal following surgical drainage, and the patient was discharged from the hospital ten days later.

The temperature suddenly became elevated and a profuse biliary drainage was observed in the twenty-seventh postoperative day in a patient who also had a gastric resection performed at the same time as the cholecystectomy. The drainage from the biliary fistula gradually decreased and stopped entirely after twenty-four days,

TABLE V

Cholecystectomy	No. of Cases	No. of Complications	Per cent Complication
Cholecystectomy	113	11	9.7
Cholecystectomy and appendectomy	93	12	12.9
Cholecystectomy and associated surgery	9	2	22.2
Cholecystectomy and choledochostomy	35	4	11.4
Totals	250	29	11.6

but the patient's total postoperative hospital stay was fifty-one days.

A common duct obstruction occurred in one patient following a cholecystectomy and choledochostomy. During the operation, the common duct was opened and a probe was inserted into the duodenum. The injection of saline through the T-tube readily passed into the duodenum. Postoperatively, the patient continued to be jaundiced, and cholangiograms revealed a complete obstruction at the distal end of the common duct. At the second operation, fifteen days later, the attempt at passing a probe through the common duct into the duodenum was unsuccessful, thus necessitating opening the duodenum and removing an impacted stone in the ampulla of Vater.

The dreaded complication, ligation of the common duct, occurred only once in this series of 250 consecutive cholecystectomies. The patient developed clay-colored stools and jaundice following surgery and a second operation fifteen days later revealed that the common duct had been previously ligated. The sutures were removed from the common duct, and a Vitallium tube was anchored into the ends of the common duct, thus restoring the continuity of the duct. The patient did remarkably well and was discharged eleven days following the insertion of the Vitallium tube.

As was mentioned previously, the incidence of complications in the 250 cholecystectomies was 11.6 per cent. The incidence of complications was, however, somewhat higher in the cases in which appendectomies, other abdominal operations and choledochostomies were performed in addition to the cholecystectomy.

Only four deaths occurred in this series of 250 consecutive cholecystectomies, giving a remarkably low operative mortality of only 1.60 per cent. A brief summary of the deaths will be given:

Case 1.—A forty-two-year-old woman was operated on July 14, 1943, for an abscess with draining sinus in the right hypochondrium. Stereoscopic films made after the injection of an opaque media into the sinus revealed a sinus tract in the right side of the abdomen communicating with a large superficial pocket starting at the level just below the liver and extending deeper and down to a level just above the crest of the right ileum. The patient was operated upon, and after the injection of methylene blue the entire sinus tract was excised. There was no evidence of the sinus tract penetrating the fascia and communicating with the abdominal cavity. The patient continued to run a postoperative septic fever, and on August 4, 1943, an abdominal exploratory oper-

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ation was performed. A perforated gall bladder containing stones was found which was removed, but the patient died from septicemia on the thirtieth postoperative day.

became suddenly elevated on the second day following the cholecystectomy. A considerable amount of thick, muco-purulent secretion was aspirated from the trachea and the right and left bronchi, but the patient expired

TABLE VI. COMPLICATIONS & MORTALITY PER SURGEON

Surgeons	No. of cases	Complications	Per cent Complications	Deaths	Per cent Mortality
A	60	Wound infection (2) Pneumonia (3) Paralytic ileus (1) Hydrothorax (1) Spinal headache (1) Subdiaphragmatic abscess (1) Coronary thrombosis (1) Total 10	16.7	Pneumonia Coronary thrombosis (1)	(1) 3.33%
B	42	Wound infection (3) Atelectasis (1) Wound disruption (1) Pulmonary embolism (1) Total 6	14.3		0
C	40	Wound infection (1) Wound disruption (1) Total 2	5.0		0
D	22	Pleurisy (2) Biliary fistula (1) Total 3	13.6		0
E	13	Ligation C. D. (1) Paralytic ileus (1) Pneumonia (1) Total 3	23.1	Paralytic ileus (1)	7.69
F	12	Pul. embolism (1) Septicemia (1)	16.7	Septicemia	(1) 8.33
G	9	Common duct obstruction (1) (stone)	11.1		0
H	7	Subdiaphragmatic abscess (1)	14.3		0
I	7	0	0		0
J	7	0	0		0
K	6	0	0		0
14 surgeons (3 or less each.)	25	Wound infection (1)	4.0		0
Totals	250		29	4	1.60

Case 2.—A sixty-two-year-old woman was operated on January 15, 1944, for chronic cholecystitis with cholelithiasis. A cholecystectomy was performed, and the patient's condition on leaving the operating room was described as good. Eight hours following surgery the patient suddenly experienced pain in her chest, dyspnea and became extremely cyanotic and expired a few minutes later. Autopsy confirmed the cause of death as being due to coronary thrombosis with myocardial infarction.

Case 3.—A cholecystectomy was performed on December 3, 1943, in a sixty-year-old female for obstructive jaundice with a pathological gall bladder. At operation, the gall bladder was found to be distended with numerous stones, and three large calculi were removed from the common duct. The patient developed a severe abdominal distension and expired on the sixth day from a postoperative paralytic ileus.

Case 4.—A fifty-two-year-old woman was operated on September 18, 1942, for chronic cholecystitis with cholelithiasis. The temperature, pulse and respirations

on the second postoperative day from atelectasis and bronchopneumonia.

As was mentioned previously, the 250 consecutive cholecystectomies were performed by a group of twenty-five doctors.

The largest number of operations performed by one surgeon was on sixty patients. There was a total of twenty-five cholecystectomies performed by fourteen different surgeons, each of whom did a maximum of three or less cases. It is surprising to observe that the incidence of complications was lower in the "occasional operator" group as compared to the surgeons who had performed the larger number of cholecystectomies. The surgeon with the sixty cases had ten complications, or an incidence of 16.7 per cent, whereas there was only one complication, an incidence of 4 per cent, and that merely being a skin infection, in the total twenty-five cholecystectomies which were performed by the fourteen different surgeons. The fact that the mortality and

incidence of complications was lower in the "occasional operator" group as compared with surgeons who performed the larger number of cholecystectomies was no doubt due to more careful avoidance of bad risk cases as well as other precautions on the part of both patient and physician. In this connection, the official granting of "operating room privileges" by the Board of Directors of Asbury Hospital, first instituted in Minneapolis in May, 1944, may have some bearing on the low incidence of mortality and complications as shown in this report.

Summary

An analysis was made of 250 consecutive cholecystectomies which were performed at Asbury Hospital by a group of twenty-five doctors. Nine of the group of twenty-five doctors are members of the Minneapolis Surgical Society, and they performed 78.4 per cent of the total cases. All operations of the gall bladder and duct system in which a cholecystectomy was performed are included in this analysis.

The average age of the patient in this series was forty-six years.

Women who underwent a cholecystectomy predominated over men by a ratio of 5 to 1.

The average postoperative hospital stay for non-complicated cholecystectomies was 13.5 days and 28.3 days for the cases in which complications occurred.

Sodium pentothal intravenously and cyclopropane in combination with curare is becoming the anesthetic of choice, replacing the once enjoyed popularity of ether anesthesia.

A total of twenty-five complications occurred, or an incidence of 11.6 per cent, with skin infections being responsible for 24.2 per cent of the total number of complications.

The operative mortality for the 250 consecutive cholecystectomies was 1.60 per cent. The reasons for the lower incidence of complication and deaths in the "occasional operator" group were given.

Discussion

DR. FELIPE TORRES: What type of incisions and suture material are used? Also, how early do the patients get up?

DR. JOHANN: The majority of the surgeons preferred and used the transverse incision which permits adequate exposure and earlier postoperative ambulation. In regard to suture material, the number of advocates of non-absorbable and absorbable sutures were about equal. The majority of the non-absorbable suture enthusiasts preferred silk to cotton. The time of postoperative ambulation varied from the second to the twelfth day depending on the surgeon, but there was a definite tendency in the past year to get patients out of bed sooner.

DR. DOUGLAS ADKINS: What do you think about the hospital records as to the complications that were not recorded?

DR. JOHANN: I believe that the hospital records were indeed complete and reliable.

AUGUST, 1946

BENIGN STRICTURES OF THE EXTRA-HEPATIC BILE DUCTS AT THE UNIVERSITY OF MINNESOTA HOSPITALS

(Inaugural Thesis)

JOHN R. PAINE, M.D.
Minneapolis, Minnesota

Causes of Strictures

Benign strictures of the extrahepatic bile ducts are due to operative trauma practically without exception. In a series of ninety-eight such cases reported in 1940 by Walters and Lewis only one case could definitely be stated as not being due to mechanical injury at the time of operation. In the thirty-three cases seen at the University of Minnesota Hospitals during the past seven years some operation on either the gall bladder or common duct has preceded the formation of the stricture in every instance. Trauma incident to a simple cholecystectomy is by all odds the most frequent circumstance producing such strictures. Choledochostomy with or without cholecystectomy is responsible in our experience for only 15 to 20 per cent of the strictures.

Too often does the surgeon hear a perplexed and often worried colleague say, "I can't understand how I could have injured the duct. It was such an *easy* cholecystectomy." In such a remark lies the clue to much of the difficulty. The operation seemed to be so easy that it could be and was done in a hurried manner without adequate dissection of the structures in the porta hepatis.

There are three fundamental reasons why the extrahepatic bile ducts may be injured during a cholecystectomy.

The first of these is the frequent occurrence of anatomic anomalies in the bile ducts and the cystic artery. That these anomalies occur is well known and the surgeon should always be on the lookout for them. The exact relationship between the cystic and common hepatic ducts should always be demonstrated before the former is clamped.

The second reason is unexpected bleeding from the cystic artery or an anomalous vessel. Often in the excitement of such moments one or more hurried and inaccurate attempts are made with a hemostat to secure the bleeding point. Not infrequently some part of the duct is included and crushed in the jaws of the clamp. It should not be forgotten that gentle compression of the porta hepatis between the forefinger, in the Foramen of Winslow, and the thumb, on the anterior surface of the gastrohepatic ligament, will safely control the bleeding until the severed vessel can be adequately exposed and accurately clamped.

The third reason is the distortion produced in the common duct by traction on the ampulla of the gall bladder transmitted through the cystic duct. Traction thus produced frequently tents up the common duct at its point of union with the cystic duct and obscures this point of union so that the cystic duct clamp if placed in a hurried fashion may include all or a portion of the circumference of the common duct.

To safeguard against these injuries all of the sur-

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gical residents at the University Hospitals are taught that no cystic duct is to be clamped unless dissection has been complete enough to visualize the common duct both above and below the junction of the cystic duct,

amount of drainage becomes less gradually and simultaneously jaundice develops. For a time the drainage may be intermittent and the degree of jaundice variable. Eventually all drainage ceases and the jaundice becomes

TABLE I. OPERATIVE PROCEDURES EMPLOYED
1938-1946

	1st Op.	2nd Op.	3rd Op.	4th Op.
1. End-to-end anastomosis with T-tube	16	3	2	
2. End-to-end anastomosis with Lucite tube	1	2		
3. End-to-end anastomosis with vitallium tube	1			
Sphincter Oddi Preserved				
4. End-to-end anastomosis with catheter		2		
5. Dilatation with T-tube	1	2		
6. Dilatation with Lucite tube	2			
7. Incision with T-tube	2			
8. Removal Lucite tube		2	1	
9. Exploration only	1			
Sphincter Oddi Sacrificed				
1. External biliary fistula	4	2	1	1
2. Choledochogastrostomy	1			
3. Choledochoduodenostomy	1	1		
4. Choledochojejunostomy	3	1		
Total	33	15	4	1

and then with only a minimal amount of traction on the ampulla of the gall bladder. They are further instructed that the cystic artery should preferably be isolated and clamped separately from the cystic duct before ligation. After saying this, it is somewhat paradoxical to add that two of the thirty-three strictures seen at our clinic in the past seven years have followed trauma produced by our own residents. I prefer to believe that the above rules are good ones but that their application has not been entirely perfect.

Recognition of Strictures

If it be a surgical sin to traumatize the common duct during cholecystectomy it is an even greater sin to traumatize the duct and not to recognize at the time that injury has been done. All reported series indicate that the best results follow those repairs of the common duct which are made at the time of the injury before biliary obstruction and its sequelae have appeared. In our experience the details of the patient's history have usually not been well enough known to say definitely whether or not an immediate repair has been attempted. It seems highly probable, however, that in the majority of cases an immediate repair has not been made. On the other hand, a stricture has usually first been suspected in the postoperative period after an interval of time varying from a few days to many months. The patient at that time usually presents a clinical picture which can be placed in one of the three following categories:

1. *Instances in which a defect has been made in the common duct:* In this situation bile begins to drain from the abdominal wound in the immediate postoperative period and continues to do so for several weeks. The

persistent and severe. In time cholangitis usually appears.

2. *Instances in which the duct has been traumatized but not opened:* Under these circumstances the postoperative convalescence appears to be normal. Several months later and frequently unassociated with pain, a progressively increasing jaundice appears. At any time during this period cholangitis may appear.

3. *Instances in which the common duct has been occluded by ligature:* If the occlusion has been complete a progressive jaundice develops immediately after the operation. Pain is frequently minimal. If the occlusion has been partial, the course is similar to that in those cases where the duct has been traumatized but not opened or constricted. Cholangitis may develop. If, by chance, the occluding ligature should loosen after a time, the jaundice may improve following the discharge of a large amount of bile into the abdomen or through the wound to the outside. In this case the subsequent course will be that indicated for those cases in which a defect has been made in the common duct.

The Problem of Surgical Repair

Although everyone agrees that patients with benign strictures require some type of surgical procedure to improve or cure their difficulties no one operation has yet been devised which will satisfactorily correct the condition in a sufficiently large percentage of cases to enjoy acceptance and approval by a majority of surgeons. There would appear to be two reasons for this: (1) the inability of one operation to deal effectively

with all the pathological variations found at operation; and (2) doubt as to the advisability of sacrificing the function of the sphincter of Oddi.

The principal types of operations that have been employed in the past for the correction of common duct strictures are as follows:

1. *Cholechojejunostomy or hepaticojejunostomy*: Variations of this operation have been described during the past year by Dr. Arthur Allen of Boston and Dr. Warren Cole of Chicago. The theory involved is the utilization of a sufficient length of jejunum through which the intestinal contents do not pass from the anastomosis to the remaining proximal portion of the bile ducts. In this manner it is hoped to prevent cholangitis. Time will tell whether or not this operation, which can be applied to almost all cases of stricture, is a satisfactory solution to the problem.

2. *Cholechooduodenostomy—or gastrostomy of enterostomy*: This operation was first performed by Riedel in 1888 but Sprengel in 1891 was the first to have a patient survive. Most writers in the past have recommended this operation as the one of choice.

3. *End-to-end anastomosis of the common duct*: This operation was first performed by Doyen. On theoretical grounds it would appear to be the most physiological of all the procedures but the difficulty in locating the distal portion of the duct and the most infrequent recurrence of the stricture at the site of the anastomosis has led many operators to choose many other types of operation. The anastomosis has usually been constructed over a T-tube or catheter.

4. *Reconstruction of the common duct by a rubber tube*: This procedure was performed first by Jenckel in 1905. It is known also under the names of Wilms-Sullivan operation or the McArthur operation. In 1912 Sullivan reported the successful repair of segmental defects in the common ducts of dogs by the construction of a sleeve of omentum and peritoneum around an indwelling catheter. In 1923, McArthur recommended the insertion of a rubber tube to bridge the gap without attempting to reconstruct the duct. Apparently a few brilliant results have been obtained by this method but the recurrence of a stricture is so frequent that it should be avoided when possible.

5. *Formation of an external biliary fistula*: This procedure is usually made only as a last resort. Attempts to implant the fistula into the gastro-intestinal tract have been failures in almost every instance.

6. *Incision or dilatation of the stricture*: In carefully chosen cases these operations can be expected to give fairly satisfactory results if a T-tube or catheter be inserted for a time.

In any critical analysis of operations for the relief of strictures of the common duct, considerable thought should be given to whether or not the function of the sphincter of Oddi should be sacrificed. Fundamentally, the answer to this question revolves around the cause

of cholangitis and in the writer's opinion, this has not been definitely settled. Certain it is that many cases with biliary obstruction with functioning sphincter have developed cholangitis in the absence of any fistula between the bile ducts and the gastro-intestinal tract. On this type of evidence many people believe that obstruction is the most important cause of cholangitis. On the other hand, some cases with biliary obstruction continue for an indefinite time without developing any of the signs or symptoms of cholangitis.

There is considerable indirect evidence that prevention of the regurgitation of the contents of the gastro-intestinal tract into the extra-hepatic bile ducts is an important factor in the prevention of cholangitis. Horsley, Lehman, and Gatewood and Poppens have reported large series of dogs in which the gall bladder has been anastomosed to various parts of the gastro-intestinal tract. Cholangitis was found to be consistently present after all these procedures and many surgeons believe that like results occur in the human being following any operative procedure which does not preserve the function of the sphincter of Oddi.

The popularity, which cholechooduodenostomy or enterostomy have enjoyed in the past, would seem to have been due to the relative facility of performing this type of operation in the average case of stricture, as compared to the end-to-end anastomosis of the duct after the stricture has been excised. In deeply jaundiced, poor-risk patients such a consideration was important. The pre-operative preparation of such patients with Vitamin K, the use of cyclopropane anesthesia and blood transfusions, however, now enable time-consuming operations to be carried out in jaundiced patients with relative safety. In addition it has been stated that end-to-end anastomosis is frequently impossible because (1) the duct distal to the stricture cannot be located and (2) the length of the stricture frequently prevents an anastomosis from being made without undue tension on the suture line. We do not believe that these objections to end-to-end anastomosis are valid in the majority of cases. Many cases of stricture of the extra-hepatic bile ducts can be repaired by this operation if certain points in operative technique are observed as follows:

1. The distal portion of the common duct may be located by either opening the duodenum and probing in a retrograde direction through the ampulla of Vater or by cutting transversely just above the first portion of the duodenum all those structures lying to the right of the hepatic artery and anterior to the portal vein.

2. Incision of the peritoneum at its reflexion from the duodenum to the posterior abdominal wall will permit the duodenum and head of the pancreas to be freed so that they may be rotated about the superior mesenteric vessels in a clockwise direction. In most instances this maneuver enables an end-to-end anastomosis to be constructed without undue tension on the suture line.

Report of Cases, 1938-1946

That these ideas can be successfully applied in practice has been demonstrated by the experience at the University of Minnesota Hospitals during the past eight

MINNEAPOLIS SURGICAL SOCIETY

years. During this period there have been thirty-three patients with benign strictures of the extrahepatic bile ducts operated upon by six different surgeons. In one patient the dilated proximal portion of the duct system

mation is available concerning only fifteen patients whose last operation has been two or more years ago. Of these patients twelve have had their sphincters preserved and three have had their sphincters sacrificed.

TABLE II. RESULTS OF TREATMENT

Final Operative Procedure	Deaths	Well	Indefinite Symptoms	Jaundice or Cholangitis	
				Moderate	Severe
1. End-to-end anastomosis with T-tube	1	6 (6)	2 (2)		1 (1)
2. End-to-end anastomosis with Lucite tube		1	1		
3. End-to-end anastomosis with catheter		1			
4. Dilatation with T-tube		1	1 (1)		
5. Incision with T-tube		2 (2)			
6. Exploration	1				
7. Removal of Lucite tube		1	1		
1. External biliary fistula	1	3 (1)		2 (1)	
2. Choledochoduodenostomy		1 (1)			
3. Choledochojejunostomy		1		1	1
Total	3	17 (10)	5 (3)	3 (1)	2 (1)

(Results not known on three patients.)

could not be found. This individual died seven days after operation in coma with unrelieved jaundice. A second patient died a few days after the sixth operation performed for the relief of a stricture and its complications. The third patient died approximately one year after an apparent cure of the stricture by an end-to-end anastomosis. The cause of death was the rupture of an aneurysm of the hepatic artery following injury of the artery with a needle at the time of operation.

Except for those patients operated upon during the greater part of 1945, when it was desired to try the Allen type of operation (choledochojejunostomy) a concerted effort has been made to remove the stricture without sacrificing the sphincter of Oddi. Those patients in whom the Allen type of operation has been used number four. Fifteen patients have had to be operated upon more than once and one patient had four operations. At the initial operation, in the thirty-two patients in whom the dilated proximal portion of the duct could be found, the sphincter of Oddi was preserved in twenty-three.

Follow-up interviews or letters have been obtained in twenty-seven of the thirty patients thought to be still alive. Eighteen of these patients still have functioning sphincters of Oddi and in nine patients the sphincter has been sacrificed. Twenty-two of these twenty-seven patients are in good health, either entirely well or with such mild and indefinite symptoms that they are in no way incapacitated. Four patients have a moderate to severe cholangitis. Three of these four patients are among those patients who have had the function of their sphincter of Oddi sacrificed. It must be remembered, however, that a considerable period of time must pass before the end result of an operation for a stricture of the bile ducts can be correctly evaluated. Infor-

Eleven of the former are in good health and two of the latter are in good health.

Discussion

One question of great concern to the surgeon who undertakes to operate upon any patient with a stricture of the bile ducts is the correct management of those patients in whom tubes of some sort are used to reconstruct the duct or to form a biliary-intestinal fistula. For this purpose we ourselves have used almost without exception rubber T-tubes. Dennis has experimented with tubes of lucite to which he has attached a rubber stem. Dr. Herman Pearse of Rochester, New York, has recommended the use of a straight flanged tube of vitallium. It was formerly our plan to have the patient carry a rubber T-tube for approximately a year if the bile duct had been reconstructed over it either by an end-to-end anastomosis or by some more minor plastic procedure or after a dilatation of the duct. It was thought that all tendency of the scar in the duct to contract at the operative site would have ceased by that time. It was found, however, that, although isolated cases occur in which a rubber tube may remain in the bile stream indefinitely with no encrustation occurring about it, in the majority of cases after a few months, cholesterol and bile pigments are deposited, which may completely occlude the lumen of the tube. In an attempt to avoid this in the future, it is planned to remove all such tubes after six months. Dennis has employed tubes made of lucite, a synthetic plastic which produces practically no irritation of the body tissues in an effort to avoid this difficulty. The results, however, have been only partially successful. Of five tubes inserted three have had to be removed because of obstruction due to encrustations. Our experience with a vitallium tube has included only

one patient in whom the tube had to be removed after four years because of recurrence of the bile duct obstruction. At the time of removal, it was found to be encrusted and completely occluded with the same type of deposit as that seen commonly on rubber tubes.

One further point should be mentioned. If a T-tube be used in the repair of a common duct stricture, the stem of the tube must not be brought out through the wall of the common duct at the site of the stricture but rather as far removed from the site of the stricture as is conveniently possible. If this is not done, the trauma to the duct wall caused by the withdrawal of the tube greatly predisposes to the recurrence of the stricture. The author feels sure that several of the recurrences of stricture in the earlier cases of this series were due to this factor before its importance was recognized.

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Discussion

DR. IVAR SIVERTSEN: There is one item that has not been mentioned, to wit—when are we supposed to remove the T-tube after doing a choledochostomy?

Some time ago, a case in point, where a T-tube was removed on the tenth or eleventh day postoperatively, we apparently had the complication of a kinking of the duct, by pulling it toward the abdominal wall so that the bile did not go down through the duct itself but came through the abdominal wall, and no evidence of bile was showing in the stool. This patient became gradually worse and several of my confreres saw the patient in consultation, and notwithstanding that most of them felt that it was not necessary to go inside and free the duct from the abdominal wall, the patient went from bad to worse. Consequently he was taken to the operating room and the duct was freed from adhesions around the abdominal wall. After this procedure the patient improved steadily, and I am sure that if he had not been operated upon he would have died. Therefore, I am wondering when the T-tube should be removed.

DR. JAMES HAYES: I enjoyed Dr. Paine's discussion. Dr. Paine mentioned the vitallium tube brought out by Pearse in 1941.

I have some slides of cases in which I used this tube. About the time Pearse published his work with the vitallium tube, I had an interesting case that was giving me much concern.

A school teacher in this city had already been operated upon twice before I saw her. She had been jaundiced for some time. On exploration I could find only a remnant of the common duct proximally and distally. I put in a McArthur tube and closed the wound with a drain down to the site of the repaired duct. The patient did well for a few weeks but then became jaundiced and showed no bile in the stool. December, 1941, I in-

serted a vitallium tube in place of the McArthur tube. After a stormy convalescence she recovered and has been well since. I saw her this past week. She has been teaching steadily since and has no complaints whatever now.

A short time later I inserted one in a man who had been operated upon twice previously. At his previous operation a T-tube had been inserted and left for two or three months. He was well for about one year when he became jaundiced again. The mid-portion of the common duct was atrophied and completely shut off. I resected this mid-portion and inserted a vitallium tube. He is now running a laundry in St. Paul and has been well since.

I have a third one who was well when I last heard from him but at present I have lost track of him.

A fourth patient died of cancer of the liver in the University Hospital about one year after I had inserted a vitallium tube.

A fifth patient had been operated twice by an osteopath and once by a surgeon. For two years he had been draining bile externally. Exploration showed a marked degree of atrophy of the liver. Only a thin watery type of bile could be obtained from the hepatic duct. The patient died of hepatic deficiency following operation.

As Dr. Pearse said in his discussion the vitallium tube may be used in these cases after other methods of common duct repair have failed. Only time will tell how this method of repair compares with other methods.

DR. N. K. JENSEN: What is the incidence of stricture formation at the point of the insertion of the T-tube? How often does stricture occur?

DR. JOHN R. PAINE: As far as I know, in none of these cases have we had strictures. Most of them have been followed. We are always careful to cut out the T-tube in such a way that when you withdraw the tube the ends fold up together and come out easily.

DR. EDWIN BENJAMIN: In these cases of strictures where the patients had been obstructed for quite a long time, was there resultant liver damage? Is there any time limit in which one would expect there to be permanent liver damage, or does the liver function again normally?

DR. JOHN R. PAINE: We have not in this series studied the degree of liver damage. There is, no doubt, information on the charts. Of course, we have had the benefit of Doctor Watson's help, and most of these patients have come through his service. Most of them do show liver damage. Now it is my impression that the amount is rather variable, and I do not say it is in direct ratio with the cholangitis. How soon can it come on? That is a variable thing too.

DR. CLARENCE DENNIS: I would like to say this with regard to the use of T-tubes as splints in the repair of common duct strictures. When the anastomosis is made at the site of the vertical limb of the T-tube, it has been our experience that enough injury to the duct occurs upon withdrawal of the T-tube to lead in many cases to reformation of stricture at that site. A much more satisfactory arrangement is the one which Doctor Allen mentioned when he talked here a year ago, namely, the repair of the duct over a catheter which is brought out through the ampulla of Vater across the duodenum and out the anterior wall of the duodenum as a Wetzel type of catheter enterostomy. This tube may be removed in two or three weeks and in those patients in whom it has been employed, we seem thus far to have had very satisfactory results.

DR. JOHN R. PAINE: It has been done only in two or three cases within the past year. I wouldn't be prepared

(Continued on Page 844)

◆ Reports and Announcements ◆

MEDICAL BROADCAST FOR AUGUST

The following radio schedule of talks on medical and dental subjects by William O'Brien, M.D., Director of Postgraduate Medical Education, University of Minnesota, is sponsored by the Minnesota State Medical Association, the Minnesota State Dental Association, the Minnesota Hospital Association and the University of Minnesota School of the Air.

August		
1—1:15	WCCO	Urticaria
3—11:30	KUOM-KROC-KFAM	Medicine in the News The Hospital as an Emergency Care Center
6—1:15	WCCO	Asthma
8—1:15	WCCO	Medicine in the News
10—11:30	KUOM-KROC-KFAM	Duties of the Public Health Nurse
13—1:15	WCCO	Seasonal Pollinosis
15—1:15	WCCO	Medicine in the News
17—11:30	KUOM-KROC-KFAM	The Hospital—a Diagnostic Center
20—1:15	WCCO	Gastro-intestinal Allergy
22—1:15	WCCO	Medicine in the News
24—11:30	KUOM-KROC-KFAM	The Human Side of Nursing
27—1:15	WCCO	Minnesota's Dental Program
29—1:15	WCCO	Medicine in the News
31—11:30	KUOM-KROC-KFAM	

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians announces its Twenty-eight Annual Session to be held in Chicago, Illinois, April 28-May 2, 1947.

Dr. David P. Barr, New York, is President of the College, and will be in charge of the program of General Sessions and Lectures. Dr. LeRoy H. Sloan, Chicago, has been appointed General Chairman, and will be in charge of the program of Hospital Clinics and Panels, as well as local arrangements, entertainment, et cetera. Mr. Edward R. Loveland, Executive Secretary of the College, 4200 Pine Street, Philadelphia 4, will have charge of the general management of the session and the technical exhibits.

Other medical societies are urged to note these dates in order that conflicts in meeting dates may be avoided for mutual benefit.

NATIONAL ARTHRITIS RESEARCH FOUNDATION

A National Arthritis Research Foundation has been initiated by the officers and trustees of the Levi Memorial Hospital at Hot Springs National Park, Arkansas, and a campaign to raise \$2,500,000 to finance the project is now under way. Facilities of the hospital, which has specialized in the care of arthritics since 1914, will be absorbed by the Foundation which has been endorsed by the officers of the American Medical Association and numerous eminent scientists.

Arthritis is a major cause of disability, and research in prevention and treatment is greatly needed. The Foundation deserves the support of both the medical profession and the laity.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held Monday, September 9, 1946, in Faribault, with scientific sessions in Shattuck Military Academy Auditorium.

Registration will be from 8:00 to 9:00 a.m.

Entertainment will be provided for the ladies.

The scientific program will begin at 9:00 a.m., and will consist of a morning and afternoon session. There will be a noon-day luncheon, and a banquet in the evening.

Scientific Program

Internal Derangements of the Knee—P. R. LIPSCOMB, M.D., Rochester

Intolerance to Common Drugs in Asthma—J. L. MORGAN, M.D. and L. E. PRICKMAN, M.D., Rochester

Recent Advances in Dermatology—L. A. BRUNSTING, M.D., Rochester

Experience with Folic Acid in the Treatment of Pernicious Anemia—C. H. WATKINS, M.D. and BYRON E. HALL, M.D., Rochester

The Clinical Use of Streptomycin—W. E. HERRELL, M.D., Rochester

Symptomatology of Hernia of the Diaphragmatic Hiatus—J. B. CAREY, M.D., Minneapolis

Clinical-Pathological Conference—J. W. KERNOHAN, M.D., Rochester

Review and Analysis of 152 Cases of Poliomyelitis Admitted during 1944 at Minneapolis General Hospital—J. C. MICHAEL, M.D. and S. S. RAMSDALL, M.D., Minneapolis

Gastric Neurectomy (Vagotomy) in the Treatment of Duodenal Ulcer—W. WALTERS, M.D., Rochester

The Problem of Gastric Cancer—O. H. WANGENSTEEN, M.D., Minneapolis.

INTERNATIONAL COLLEGE OF SURGEONS

An international surgical assembly sponsored by the United States Chapter, International College of Surgeons, will be held in Detroit, Michigan, October 21, 22, 23, 1946. An intensive clinical and didactic program by world authorities will be presented. (See page 831).

All medical men and women in good standing are cordially invited. Program and information on the Assembly and the primary qualifications for Fellowship in I.C. of S. are available by writing L. J. Garipey, M.D., Secretary, 16401 Grand River, Detroit, 27, Michigan.

NATIONAL CONFERENCE ON CO-OPERATIVE HEALTH PLANS

The National Conference on Co-operative Health Plans will be held at Two Harbors, Minnesota, August 15 to 18. About 150 delegates are expected to attend. Dr. Dean Clark, director of a pre-payment medical plan for Greater New York, formerly a member of the staff

(Continued on Page 830)

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CO-OPERATIVE HEALTH PLANS

(Continued from Page 828)

of the U. S. Public Health Service, and a recognized authority on pre-payment plans, will speak on "An Evaluation of Voluntary Health Plans." Dr. Kingsley Roberts, well known for his work in medical economics, will discuss "The Place of Group Practice and Preventive Care in Co-operative Health Plans."

Others scheduled to make addresses are Dr. Michael Shadid, of the Community Hospital, Elk City, Oklahoma; Henry Becker, president of the Group Health Association, of Washington, D. C., and Winslow Carlton, of the Group Health Co-operative of New York City.

GASTRO-ENTEROLOGY AWARD

The National Gastro-enterological Association has announced the winner of its 1946 Cash Prize Award Contest for the best unpublished manuscript on Gastro-enterology or an allied subject.

The winning contestant was Capt. Irving B. Brick, MC, AUS, whose paper on "Radiation Effects on the Human Stomach: A Preliminary Report" was selected by the judges.

Certificates of Merit were also awarded to Dr. Frank L. Apperly, Richmond, Va.; Dr. William Nimch, Mexico City, Mexjco, and Dr. Juan Nasio, Rosario, Argentina.

The winning paper, as well as those receiving Certificates of Merit, will be published in the *Review of Gastroenterology*, commencing with the September-October 1946 issue.

ASSOCIATION OF MILITARY SURGEONS

Reservations already received for the convention of the Association of Military Surgeons of the United States to be held in Detroit, October 9 to 11, inclusive, indicate that attendance this year will be unusually heavy. Therefore, all members planning to take part in the convention are urged to send in their reservations immediately so as to be sure of obtaining proper hotel accommodations. Dr. Carleton Fox, General Convention Chairman, announces that Lt. General Walton H. Walker, commanding general of the Fifth Army has accepted an invitation to serve as honorary chairman. Other members of the honorary committee are General Bliss, U. S. Army; Captain Cole, U. S. Navy; Dr. Williams, U. S. Public Health Service, and General Hawley, Veterans Administration, who will serve as vice chairman.

The convention will formally open Wednesday morning, October 9 at 10:00 a.m., in the ballroom of the Book-Cadillac Hotel. Addresses of welcome will be delivered by Edward J. Jeffries, mayor of the city of Detroit; Dr. W. B. Harm, president, Wayne County Medical Society; Dr. Louis Braun, president, Detroit District Dental Society, and Dr. James E. Patterson, president, Southeastern Michigan Veterinarian Association. Highlighting the initial session will be the presidential address delivered by Col. Ervin Abel, president,

(Continued on Page 832)

MINNESOTA MEDICINE

INTERNATIONAL SURGICAL ASSEMBLY

UNITED STATES CHAPTER, INTERNATIONAL COLLEGE OF SURGEONS

MASONIC TEMPLE, DETROIT, OCTOBER 21, 22, 23, 1946

President, Herbert Acuff, Knoxville, Tenn. President-Elect Custis Lee Hall, Washington, D. C., Secretary & Chairman
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Banquet Speakers: Fleet Admiral Chester W. Nimitz, Vice Admiral Ross T. McIntire, Surg. Gen. Navy, and Morris Fishbein, M.D.

The following is list of members of the profession who will take part in program:

Lyon H. Appleby, Vancouver, B. C.	David deSanson, Rio de Janeiro, Brazil	Lowrain E. McCreary, Philadelphia
Hamilton Bailey, London, Eng.	Francisco Grana, Lima, Peru	Raymond W. McNealy, Chicago
W. Wayne Babcock, Philadelphia	J. P. Greenhill, Chicago, Ill.	Karl A. Meyer, Chicago
Harry E. Bacon, Philadelphia	E. S. Gurdjian, Detroit	J. H. Mulholland, New York
Channing W. Barrett, Chicago	Custis Lee Hall, Washington, D. C.	Rudolf Nissen, New York
Moses Behrend, Philadelphia	Stuart W. Harrington, Rochester, Minn.	Richard H. Overholt, Brookline, Mass.
A. A. Berg, New York	Rudolph Jaeger, Philadelphia	Col. John F. Pick, Chicago, Ill.
Prof. J. Bitschai, Cairo, Egypt	Albert Jirasek, Prague, Czechoslovakia	Carl A. Rosenbaum, Little Rock, Ark.
Gerald L. Burke, Vancouver, B. C.	Charles G. Johnston, Detroit	Max Thorek, Chicago, Ill.
Sebastian J. Carnazzo, Omaha, Nebr.	Wm. E. Johnston, Detroit	Harold C. Voris, Chicago, Ill.
Felipe Carranza, Buenos Aires, Argentina	Herbert I. Kallet, Detroit	Robertson Ward, San Francisco
Alejandro Ceballos, Buenos Aires, Argentina	Roland M. Klemme, St. Louis	James M. Winfield, Detroit
	Lloyd G. Lewis, Baltimore	Otis R. Wolfe, Marshalltown, Iowa
	Wm. C. MacCarty, Rochester, Minn.	Edwin L. Zander, New Orleans

Hotel Headquarters: Book-Cadillac Hotel and Statler Hotel. FOR HOTEL RESERVATIONS, write C. W. Husband, Chairman, Housing Committee, 1005 Stroh Bldg., Detroit 26, Mich.

Any doctor of medicine who uses surgery in his practice will find this meeting of great value. A program will be mailed to every member of the medical profession in good standing in the United States and Canada, upon request to the Secretary, about October 1.

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ASSOCIATION OF MILITARY SURGEONS

(Continued from Page 830)

The Association of Military Surgeons of the United States, and the addresses of the surgeons general, by Major General Norman T. Kirk, of the U. S. Army; Vice Admiral Ross T. McIntire of the U. S. Navy; Dr. Thomas Parren of the United States Public Health Service, and Major General Paul D. Hawley of the Veterans Administration.

SEVENTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

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September 30 through October 2

Monday, September 30

Clinical Toxicological Conference—
Lead Poisoning All Day
Surgical Conference—
The Foot in Industry..... Afternoon
Professional Relations Conference and
Dinner Evening

Tuesday, October 1

Opening General Session..... Morning
Topic—Human Relations in Industry
Elective Seminars Afternoon
Section A—Industrial Physiology
Section B—Administrative Methods
Section C—Workmen's Compensation
Dinner and Conference on Pan-American
Industrial Health Evening

Wednesday, October 2

General Session Morning
Atomic Energy—Its Effects in Industry
and Medicine
General Session Afternoon
A Positive Health Program for Industry
Dinner and Conference on Health and Welfare
Programs in Industry Evening

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◆ Of General Interest ◆

Dr. Herman E. Koop closed his offices at Cold Spring on June 15, and has discontinued his medical practice indefinitely because of ill health.

* * *

Dr. Frederick A. Figi, of the Mayo Clinic, was re-elected secretary-treasurer of the American Association of Plastic Surgeons at the annual meeting in Toronto.

* * *

After fifteen years of practice at Vernon Center, Dr. Julius A. Haes has closed his offices there and moved to Mankato, where he is associated with Dr. Austin V. Denman.

* * *

Dr. Horton C. Hinshaw was elected a vice president of the National Tuberculosis Association at the organization's forty-second annual meeting held in Buffalo, New York.

* * *

Dr. Watler W. Higgs, Park Rapids, is being assisted in his office during the summer months by his son, Robert, who is a medical student at Tulane University in New Orleans.

* * *

Dr. William A. Coventry, of Duluth, has been awarded the Distinguished Service Medal of the Minnesota State Medical Association, "in recognition of his many years in honorable practice of medicine in Minnesota."

* * *

Dr. Carl Ahl, who was associated with the Mesaba Clinic and Rood Hospital in Coleraine from 1937 until his induction into the Army Medical Corps in 1942, has returned to the Clinic.

* * *

The appointment of Dr. Byrl R. Kirklín, of Rochester, to the Advisory Board for the Bulletin of the United States Army Medical Department has been announced by the Surgeon General of the U. S. Army.

* * *

The Alexandria Clinic, composed of Dr. George W. Clifford, Dr. C. Edwin Carlson, Dr. Loren F. Wasson and Dr. Harold L. Stemsrud, is now located in the new building at 613 Broadway, which has been under construction for some months.

* * *

Dr. Richard J. Lien has entered the practice of pediatrics in St. Paul in association with Dr. Alfred J. Ouellette. Offices are maintained at Highland Village and in the Northome Business Center at 1530 Larpenteur Avenue.

* * *

Dr. Edward Starr Judd, Jr., who has been in active service in the Army Medical Corps since June 19, 1943, has resumed his work at the Mayo Clinic. Dr. Judd, with the rank of major, was attached to the 237th Station Hospital in New Guinea and the Philippines.

Dr. Paul C. Leck has resumed his practice in Austin in his offices in the Medical Building on Main Street. Dr. Leck recently completed a six months' postgraduate course in medicine and surgery, which he began immediately following his release from the Army, where he had attained the rank of major.

* * *

Dr. Gordon Paulson, who since his release from military service has been practicing at Fergus Falls, was married on June 13 to Miss Jane Lundquist at Patton, Pennsylvania. Mrs. Paulson, a former Army nurse, and the doctor met for the first time when both were assigned to duty at Naples, Italy.

* * *

After three years in military service, Dr. M. S. Sekhon has resumed his civilian practice with offices at 1533 Como Avenue. Dr. Sekhon, who is a physician and surgeon, was a captain in the Army Medical Corps. He is a graduate of Hamline and the University of Minnesota Medical School.

* * *

A special award of merit has been presented by the Minnesota Hospital Association to Dr. William A. O'Brien, director of postgraduate medical education at the University of Minnesota, in recognition of his services as chairman of the Association's Public Education Council.

* * *

According to an announcement issued by James H. Baker, executive secretary of the Hennepin County Medical Association, all but forty of the Minneapolis doctors in military service have returned to civilian practice. Those still on military assignment are mostly young men who were inducted directly from internship.

* * *

Dr. Felipe Torres, of Mexico City, is assisting Drs. Harold E. and Cecil A. Wilmot in their practice at Litchfield, Minnesota, during the summer months. Dr. Torres, who recently completed his internship, also took some special work in surgery under Dr. Martin Nordland in Minneapolis.

* * *

Dr. Iver S. Benson, formerly in practice in Willmar and Montevideo, and in recent years a member of the Bridge Clinic in Tacoma, Washington, has retired from practice because of failing health. Dr. Benson expects to make his home in Minneapolis later, but for the time being he is living at Detroit Lakes.

* * *

Dr. William Cleaves, who immediately prior to his entry into the armed services was practicing at Grand Rapids, is now associated with Dr. Werner J. Lund at the Staples Clinic.

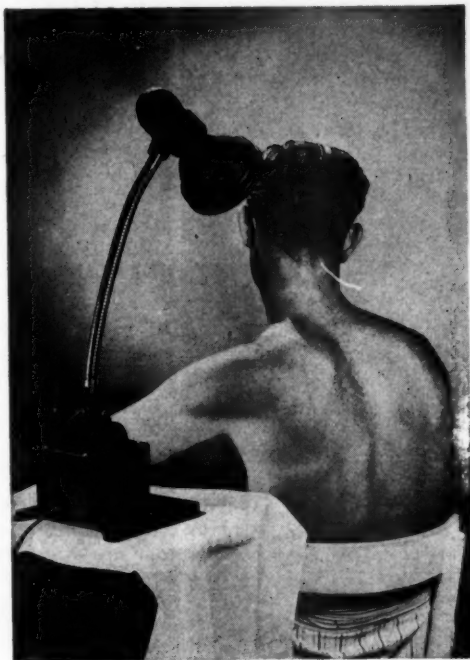
Dr. Cleaves is a graduate of the University of Minnesota. He was discharged from service last fall after

(Continued on Page 836)

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(Continued from Page 834)

forty-two months in the Pacific Theatre. Since then he has been doing postgraduate work in surgery at the University.

* * *

Dr. Walter F. Muir, a member of the clinic at Graceville until he entered military service, is now in practice at Browns Valley, which has been without a resident physician since the death of Dr. Bert V. Bates. Dr. Muir has his offices in the building formerly occupied by Dr. Bates, recently purchased by Dr. Irvin L. Oliver, of Graceville.

* * *

Dr. Edward Bratrud, of Thief River Falls, was re-elected president of the Northwestern Minnesota Association of Conservation Clubs at the annual meeting in East Grand Forks. Dr. Bratrud has announced his intention of retiring from medical practice to devote his entire time to conservation projects in which he has always been keenly interested.

* * *

Dr. Richard Scammon, of the Department of Anatomy, Graduate School, University of Minnesota, was guest speaker at the annual dinner of the Aesculapian Club of St. Thomas College at the Commodore Hotel in Saint Paul on June 11. Dr. Scammon, a national authority in his field, discussed modern trends in medicine. The club is the oldest on the St. Thomas Campus, and many prominent Twin City physicians are former members.

Dr. Winchell McK. Craig, of the Mayo Clinic, has been elected national director-at-large of the Reserve Officers of the Naval Services. He was also made a council member of the new organization. Dr. Craig, a rear admiral in the Navy Medical Corps—the highest rank attainable in the corps—was recently released from service and has resumed his work at the Clinic.

* * *

Dr. Peter J. Schultz, who recently returned from two years in military service, has opened offices in the Atkinson Clinic Building, 6 East Diamond Lake Road, Richfield. Prior to his entry into the Army Medical Corps, where he held the rank of major, Dr. Schultz was engaged in general practice in Minneapolis and Richfield with offices at Nicollet Avenue and 54th Street.

* * *

Dr. Asher A. White, internist at the Nicollet Clinic in Minneapolis, while still on terminal leave was recalled to active duty with assignment on Bikini to assist in tests for possible harmful radiation action in the bomb area. A lieutenant colonel, Dr. Asher served for three years on the atomic bomb project at Oak Ridge, Tennessee, and Richmond, Washington.

* * *

Mr. and Mrs. George T. Jacobson, St. James, Minnesota, have announced the marriage of their daughter, Phyllis Lovaun Jacobson, to Dr. Dale Quinn Furnell, son of Mr. and Mrs. Luther D. Furnell, of Saint Paul, on June 15.

Dr. Furnell, who is a graduate of the University of

OF GENERAL INTEREST

Minnesota Medical School, recently completed his internship at Ancker Hospital. Mrs. Furnell will graduate from the Hamline-Asbury School of Nursing next February.

* * *

Dr. Joseph Dawes Waller, who, with the exception of ten months' service in World War I, has been in continuous practice in Wilmont since 1915, has announced his retirement. Before locating in Wilmont, Dr. Waller was in practice in Minneapolis for seven years.

Dr. and Mrs. Waller are now living in the new home which they purchased last fall on Cross Lake in Pine City.

* * *

Dr. Howard M. Odel completed his terminal leave from the Navy Medical Corps on June 15 and has returned to the Mayo Clinic where he is a consultant in medicine. Dr. Odel entered service in December, 1943, and from the following May until December, 1945, was assigned to overseas duty on the *USS Haven*. A lieutenant commander, he was stationed at the U. S. Navy Hospital in Philadelphia since January of this year.

* * *

Major E. M. Hammes, Jr., is now on terminal leave from the army service and will be a partner of his father, Dr. E. M. Hammes, Lowry Medical Arts Building, for the next few months, after which time he will again be connected with the Mayo Clinic to complete his fellowship in neurology. Major Hammes' last assignment in the army was as consultant in nervous and mental diseases for the First Army with headquarters in Long Island, New York.

* * *

Dr. Ray D. Davis has closed his practice at Clearbrook and has moved to Waseca where he is associated in practice with Dr. Bernard J. Gallagher. Dr. Davis is a graduate of the University of Minnesota Medical School and served his internship at St Luke's Hospital in Duluth. He has been practicing for about ten years.

Dr. Gallagher has gone East with his family for an extended vacation, the first since his former associate, Dr. George Olds, was inducted into military service early in the war.

* * *

The Bronze Star Medal has been awarded to Dr. Kenneth H. Abbott, a fellow in neurologic surgery at the Mayo Foundation, "for meritorious achievement in connection with military operations against the enemy on Cebu, Philippine Islands from March 26 to April 25, 1945." The citation specifically mentions Dr. Abbott's working from eighteen to twenty hours daily, within range of enemy machine gun and artillery fire, when he performed more than 200 operations, many of which "were delicate and time-consuming brain operations."

* * *

Dr. Earl Black, who was recently released from military service, has opened offices for the practice of internal medicine, specializing in diseases of the chest, at 541 Lowry Medical Arts Building, Saint Paul. A major and platoon commander assigned to the Fifty-third Field Hospital, Dr. Black took part in the invasion of France. On V-E Day he was at Magdeburg, Germany.

AUGUST, 1946

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OF GENERAL INTEREST

Dr. Howard K. Gray, Mayo Clinic, has been presented with the Legion of Merit by the Secretary of the Navy. The accompanying citation says in part: "Captain Gray contributed greatly to the successful accomplishment of the task of inspecting and alerting Naval hospitals throughout the United States with regard to wartime surgery. . . . Captain Gray was responsible for saving the lives of many men in addition to greatly aiding these hospitals in the fulfillment of their vital missions during the prosecution of the war. . . ."

* * *

With the sale of his practice to Dr. James E. Ponterio, Dr. Frederick Buck has terminated thirty-five years of general practice in Shakopee. Dr. Ponterio, who was discharged from the Army in January, 1946, after twenty-one months of duty at the 251st Station Hospital in the South Pacific, was formerly associated with Dr. J. Anthony Malerich at the Shakopee Hospital. He is now located in Dr. Buck's former offices in the First National Bank Building.

Dr. Buck came to Shakopee from Canada in 1911. He does not anticipate making any change of residence.

* * *

Dr. George E. Brown, Jr., who was in practice at Pine City before entering military service, is now completing a fellowship at the Mayo Foundation.

Dr. Brown left the Foundation on a leave of absence in October, 1940 to enter private practice at Pine City. He was inducted into the Army Medical Corps in

January, 1944 and served both overseas and in this country during the war. He was released from active service on June 1, 1946 with the rank of major, having served his last tour of duty as Chief of General Medicine at Gardiner General Hospital in Chicago.

* * *

Mr. and Mrs. E. J. MacDonald announce the marriage of their daughter, Virginia Louise, to Dr. H. Penn Harper, son of Mrs. Nona Harper of Edina, Minnesota, which took place at the Church of the Ascension in Saint Paul.

Dr. Harper, a graduate of the University of Minnesota Medical School, was awarded the Legion of Merit for outstanding accomplishment as commanding officer of the first field hospital established beyond the Rhine.

Mrs. Harper attended the University of Minnesota and was an airline stewardess for the past two years.

* * *

Dr. Donald R. Navratil, formerly of Silver Lake, has taken over the practice of Dr. Joseph O. McKeon at Montgomery. Dr. Navratil graduated from the University of Minnesota Medical School in 1942. Following the completion of his internship at St. Mary's Hospital in Minneapolis, which included a year in surgery and eight months in residence, he enlisted in the Army Medical Corps. He was recently discharged with the rank of major after three years in service.

Mrs. Navratil, who is a registered nurse, will assist Dr. Navratil in the office.



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Eight new members and two transfers were admitted to the Hennepin County Medical Society at the May meeting. The new members are Dr. H. Francis Forsythe, 401 Medical Arts Building; Dr. Herman K. Koschnitske, General Hospital; Dr. John W. Olson, 4012 Minnehaha Avenue; Dr. John A. Seaburg, Veterans Hospital; Dr. Baxter A. Smith, 306 Medical Arts Building; Dr. Leonard A. Titrud, University Hospitals, and Dr. Robert W. Werner, 1025 West Broadway.

The transfers were Dr. Bourne Jerome, 1750 Medical Arts Building, and Dr. John W. Johnson, 751 Medical Arts Building.

* * *

Dr. Hart E. Van Riper of Scarsdale, New York, has been appointed medical director of the National Foundation for Infantile Paralysis. He has been serving as acting medical director since the death of Dr. Don W. Gudakunst in January, 1946.

A native of Kirkwood, Illinois, he received his M.D. from the University of Pennsylvania in 1930. He practiced pediatrics in Madison, Wisconsin, from 1933 to 1941, serving also as medical director of the Wisconsin Life Insurance Company. For three years he was assistant director for maternal and child health in the U. S. Department of Labor's Division of Health Services.

* * *

Dr. Aaron E. Henslin, of LeRoy, was one of nine Minnesota physicians who were made members of the Fifty Club of the State Medical Association at the regular annual meeting in May. Before coming to Minnesota in 1896, Dr. Henslin, who is now in his eighty-first

year, had been in practice in Iowa for five years. During his half century of medical service in Minnesota he delivered more than 1,200 babies. He has the distinction of having performed the first appendectomy in Mower County. Although the operation was performed on a table in a farm home, it was successful and the patient, a woman, lived for many years.

* * *

Dr. Herbert L. Stolpestad has resumed his practice at 786 East Seventh Street in Saint Paul. A captain in the Army Medical Corps, Dr. Stolpestad was a member of a staff of twelve medical officers and four surgeons at an emergency field hospital located at Tunbridge Wells, England, who worked unceasingly on D-Day for forty-eight hours, giving emergency treatment to the wounded before their evacuation to general hospitals in the interior. During the nine days immediately following, Dr. Stolpestad said that as many as 1,780 patients were cared for in a single day.

When diversion of army personnel to Japan was begun, Dr. Stolpestad was ordered to that theatre, but when two days out from Panama V-J Day was announced, the ship proceeded instead to the United States.

* * *

The National Society for Medical Research has been established under the sponsorship of the Association of American Medical Colleges with headquarters at 25 E. Washington Street, Chicago. Dr. Anton J. Carlson, professor emeritus of physiology at the University of Chicago, is president, and Ralph A. Rohweder is executive secretary.



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* * *

Dr. John Nickerson, formerly of Akron, Ohio, has entered general practice at Heron Lake, Minnesota. Dr. Nickerson is a graduate of Kent State University, Kent, Ohio. He took his medical degree at Western Reserve University, Cleveland, in 1940, and has also done post-graduate work under a research fellowship at the University of Pennsylvania. A veteran of the recent war, his military assignments included service as assistant surgeon in the Coast Guard; ward surgeon in charge of a seventy-bed ward at the Marine Hospital, where he was engaged in general surgery, orthopedics and traumatic surgery. Later he assisted in teaching a class in orthopedics for students of Tufts Medical School at the Marine Hospital.

Dr. Nickerson is thirty-two, married, and has four children.

* * *

After an absence in military service of five years, Dr. Lloyd A. Smith has returned to Balaton and resumed his practice. Inducted into the Army Medical Corps in May, 1941, Dr. Smith was on duty at various camps in this country until May 2, 1944, when he was sent overseas on assignment. He was stationed in England for a brief period, then was transferred to the continent, where he had many months of front line duty for which he was awarded the Bronze Star Medal and five Battle Stars. Dr. Smith was a major when he was discharged from service, but he has since been commissioned a colonel in the Reserve Corps. Since returning to this country last September, he has been engaged in postgraduate work in Chicago.

* * *

The Bronze Star Medal has been awarded to Dr. James R. Gay, of the Mayo Clinic, for "meritorious service . . . in the European Theatre from September 1, 1944, to April 13, 1945."

A major in the Army Medical Corps, Dr. Gay established four general, two station and one convalescent hospitals in the Paris area. He also was presented with the Medal of the French Reconnaissance from General de Gaulle, President of the Provisional Government of the French Republic, for "exceptional services of war rendered in the course of the operations for the Liberation of France."

Dr. Gay was inducted into military service in January, 1942, and he returned to the Clinic, where he is a fellow in neurologic surgery, in January, 1946.

* * *

Five University of Minnesota professors have been awarded grants for medical research by the John and Mary R. Markle Foundation, of New York City. They are:

Dr. Charles A. Evans, three grants totaling \$6,000 to be used in his study of virus infections of intra-ocular tissues and lymph nodes.



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Drs. Nathan Lifson and Victor Lorber, a grant of \$1,000 to be used in their work on carbon dioxide fixation by intact mammalian muscles.

Dr. Cecil J. Watson, \$10,800 for use in his study of porphyrin metabolism as related to nervous and endocrine function.

Dr. Ancel Keys, \$8,800, to assist in his studies on induced nutritional deficiencies and rehabilitation.

* * *

Announcement has been made of the appointment of Dr. Sigsbee R. Seljeskog as superintendent of the Elizabeth Kenny Institute in Minneapolis, succeeding Dr. Francis E. Harrington, who has been officiating on a temporary basis for the past several months because of ill health.

Dr. Seljeskog graduated from the University of Minnesota in 1936 and was in practice in Minneapolis prior to his entry into military service in 1941. A lieutenant colonel in the Army Medical Corps, Dr. Seljeskog commanded a unit of the first field hospital set up on the continent after the invasion of Normandy. He recently returned from Germany, where he had been in command of a unit of the 13th Field Hospital.

Dr. Harrington, who founded the Lymanhurst Health Center for tuberculous children, has been a resident of Minneapolis since 1920, when he was brought there to reorganize the city health department. He was city health commissioner until 1944, and between 1937 and 1945 he served as superintendent of General Hospital during two separate periods.

Contributions by the medical profession in North America to *Revista Brasileira De Medecina* have been requested by the editor, Dr. A. Da Silva Mello, professor of medicine at the University of Rio de Janeiro. Articles covering both medicine and surgery are desired and may be written in English. Translation into Portuguese will be made in Brazil, and if the material is original, a summary in English will be presented with the translation.

* * *

Dr. Edwin F. Leibold, who was recently discharged from the Coast Guard after three years of continental and overseas duty, is engaged in a partnership with Dr. Edward E. Novak in New Prague, and has purchased a home there.

A native of Shakopee, Dr. Leibold took his medical degree at Marquette University. Following the completion of his internship at St. Mary's Hospital in Duluth, he spent three months studying diseases of the chest at Nopeming.

* * *

Dr. S. F. Cepelcha has resumed his practice at Redwood Falls after an absence of five years in the Army Medical Corps. His terminal leave began last September, but he has been in surgical residence with Dr. Max Thorek, chief surgeon at the American Hospital in Chicago, until his recent return to Redwood Falls.

Dr. Cepelcha's first military assignment was as a battalion surgeon. Following a brief period of service in this country he was made a regimental surgeon and officer in charge of x-rays of a 500-bed station hospital in Alaska and remained there for twenty-one months.

OF GENERAL INTEREST

Returned to the States, he was appointed commanding officer of a medical battalion which he took to the Aleutians, where he stayed for eight months. He was then assigned to duty in this country for five months. His next assignment was with the 103rd General Hospital in England and at the same time he did post-graduate study in surgery at the University of London. Later he was made commanding officer of a station hospital of 750 beds at Villers, Helon, France. From there he was sent to Eberstadt, Germany, where he assisted in establishing a hospital center with a capacity of 5,000 patients and was made commanding officer. Dr. Cep-lecha's last overseas duty was as Commanding Officer of the 84th Armored Medical Battalion, with which he returned to this country in August, 1945. He was released from active duty in December, 1945, with the rank of colonel.

* * *

June, 1946, was a month doubly significant in the history of Brainerd, for it not only marked the city's diamond jubilee but the fiftieth anniversary of Dr. John A. Thabes' medical practice.

Dr. Thabes has lived in Brainerd since 1882, when he came with his parents from Minneiski, Minnesota. He graduated from the University of Minnesota School of Medicine in 1896 and entered practice in Brainerd in partnership with the late Dr. J. L. Camp. His present associates in practice are his brother-in-law, Dr. Irving Badeaux, and his only son, Dr. John A. Thabes, Jr.

In speaking of the early days, Dr. Thabes recalls that

there were no telephones and practically no roads; that many times the only way of getting to the patients was by horseback or walking and more than once he narrowly escaped freezing to death when lost on the prairies in temperatures of forty degrees below zero.

Dr. Thabes was the first sponsor of the Deerwood Tuberculosis Sanitarium operated jointly by Aitkin and Crow Wing Counties and he has been president of the governing board since the sanitarium was established in 1918. He is one of the founders of the Upper Mississippi Medical Society. He was the first secretary and later was president of the organization. In addition to his professional work, Dr. Thabes has also found time to take an active part in civic affairs. He served as city health officer for six years and was a member of the school board for four years.

* * *

HOSPITAL NEWS

Dr. John M. Culligan, Saint Paul physician and surgeon, has been appointed chairman of the committee in charge of the campaign to raise a \$300,000 building fund for the Villa Marie Academy conducted by the Sisters of the Ursuline Order at Frontenac. Dr. Culligan is well known in Roman Catholic circles throughout the state.

* * *

Miss Clara E. Boeck, successor to Miss Mary J. Johnson as superintendent of Union Hospital at New Ulm, assumed her duties on June 1. Miss Boeck comes from



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OF GENERAL INTEREST

Plymouth, Wisconsin, where she was superintendent of the hospital for the past four years.

Miss Johnson, who has retired, has returned to her home in Christine, North Dakota.

* * *

A program of mass x-ray surveys conducted by the Hennepin County Tuberculosis Association with treatment and rehabilitation employed in tuberculosis was presented before thirty-five members of the Nicollet County Public Health Nursing Committee at the Glen Lake Sanatorium in June.

Dr. Sumner S. Cohen, Associate Director of the Sanatorium, discussed modern methods of treatment of tuberculous patients.

* * *

Earl C. Wolf, purchasing agent at St. Mary's Hospital in Rochester, was elected first vice president of the Minnesota Hospital Association at the annual convention in Saint Paul.

* * *

Announcement has been made of the endowment of a room in the new hospital conducted by the Sisters of St. Joseph at Park Rapids by Herbert B. Stone in memory of his mother, Martha E. Mann Stone. The memorial is particularly fitting, as Mrs. Stone was a devoted and untiring worker in the hospital established in the early days of Park Rapids by her husband, the late Dr. W. T. Stone. It was while on duty there that she was stricken with the attack of apoplexy on January 21, 1917, which ended in her death two days later.

* * *

Miss Georgia Weisbrod, for many years head of the nursing staff of the Community Hospital at Clarkfield, has been appointed superintendent of the new Community Hospital at Clarkfield, which opened there on July 15.

* * *

The following officers were elected by the board of directors of the Montevideo Hospital at the annual meeting: Theodore A. Arneson, president; H. L. Hamilton, vice president, and E. O. Wilson, secretary and treasurer.

* * *

The American Hospital Association has singled out the Minnesota State Hospital Association's educational program as the best in the nation, according to a state-wide basis, for the third consecutive year. Miss Dina Bremness, president of the Minnesota organization, was presented with a plaque in recognition of the honor by Dr. Peter Ward at the annual meeting of the Association. Miss Bremness is superintendent of the Community Hospital at Glenwood.

* * *

Announcement has been made of the election of the following officers at the annual staff meeting of the Glencoe Municipal Hospital on June 11: Dr. Henry G. Goss, Glencoe, chief of staff; Dr. Arthur Neumaier, Glencoe, secretary, and Dr. Leonard Kallsted, of Brown-ton, vice chief of staff. All are veterans of World War II.

* * *

A testimonial dinner was given by the Sisters of the Order of St. Benedict, who operate the hospital at St.

AUGUST, 1946

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OF GENERAL INTEREST

Cloud, in honor of Dr. Claude B. Lewis on the occasion of his retirement from active to honorary staff member on June 20. Dr. Lewis came to St. Cloud forty-two years ago from Sauk Center, where his father was in medical practice, and joined the staff of the St. Cloud Hospital a year later. A brother of the novelist, Sinclair Lewis, he is supposed to have been the model for the character of Dr. Kennecott in *Main Street*.

* * *

E. A. Jarvinen of Minneapolis has assumed the duties of superintendent at the Itasca County Hospital in Grand Rapids, succeeding M. O. Paulson, recently resigned. Mr. Jarvinen comes to Grand Rapids with several years of experience in hospital management, having been with the Swedish Hospital, Minneapolis, and the Wright Memorial Hospital in Fergus Falls. He is a member of the Poor and Hospital Commission.

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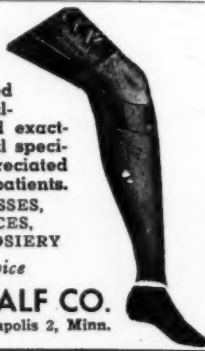
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MINNEAPOLIS SURGICAL SOCIETY

(Continued from Page 827)

to rely on that procedure. I don't know just what such a tube will do. Certainly, rubber is pretty irritating to tissues, and I feel that there would be some fibrosis caused by the use of this tube, and I wonder whether or not there will not be some damage to the sphincter of Oddi.

As to when to take the rubber tube out, I don't know. I can tell you when we take ours out and two of the things we go on. I should say there is a tendency to take out the tube earlier now, that is a tube put in following an opening into the common duct. You explore the common duct and because you open it you feel that you should put in a tube. We used to take the tubes out in three or four weeks; now we try to get them out within ten days. The last patient on whom we operated had the tube in for only eight days.

There are three tests, and we use any one of them or all three of them. First, not to take the tube out unless the patient can have it clamped and be free of discomfort for at least twenty-four hours and usually several days. Second, make a cholangiogram. I would be inclined to make all tests before removing the tube.

A test for the resistance of the sphincter of Oddi is simply to attach a water manometer to the end of the T-tube and allow saline to flow in from a reservoir which is gradually raised. The sphincter should be overcome by 90 mm. of water. Dr. George Pearse indorses this as a very valuable test. It isn't very tedious to do, but we do not do it in every case. If the sphincter of Oddi is not overcome by the pressure, we are inclined to leave the tube in a little longer. Maybe this is too scientific.

The meeting adjourned.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OPHTHALMOLOGY IN THE WAR YEARS. Vol. 1 (1940-1943). Edited by Meyer Wiener, M.D. Professor of Clinical Ophthalmology, Washington University School of Medicine; Honorary Consultant in Ophthalmology, Bureau of Medicine and Surgery, United States Navy. 1166 pages. Price, \$13.50, cloth. Chicago: Year Book Publishers, 1946.

ANESTHESIA IN GENERAL PRACTICE. Stuart C. Cullen, M.D. Head of Anesthesiology, Department of Surgery, State University of Iowa Hospitals; Associate Professor of Surgery (Anesthesiology), University of Iowa College of Medicine. 260 pages. Illus. Price, \$3.50, cloth. Chicago: Year Book Publishers, 1946.

THE MANAGEMENT OF FRACTURES, DISLOCATIONS AND SPRAIN. John Albert Key and H. Earle Conwell. Ed. 4. 1322 pages. Illus. Price \$12.50. St. Louis: C. V. Mosby Co., 1946.

The new edition of this work is essentially the same comprehensive volume as formerly. There is added material on compound fractures and newer methods have been dealt with. As in previous editions it offers a ready reference to the treatment of traumatic lesions of the skeletal system.

STEWART SHIMONEK, M.D.

VOCATIONAL AND PROFESSIONAL MONOGRAPH, Number 65, Physiotherapy. Thomas Francis Hennessey, M.D. 23 pages. Price, 75 cents. Boston, Massachusetts: Bellman Publishing Company, Inc., 1946.

This monograph, one of a series of seventy-five occupational booklets, gives factual information to whom-ever seeks information in helping choose a life's work or to those who act as advisors in such choices. The outline includes personal qualifications, and scholastic training needed to enter the field and the employment and remunerative possibilities.

The guide to the field of Physiotherapy gives encouragement to those interested in this branch of medical therapy. The author, who has been in the field as practitioner and teacher for twenty-five years, says that he is unable to discover a serious disadvantage for the physiotherapy technician and that the advantages are numerous.

M. J. O. GULLINGSRUD, M.D.

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